

**POPULATION AND ECONOMIC PROJECTIONS
FOR THE STATE OF HAWAII TO 2020
DBEDT 2020 SERIES**

Report of Results and Methodology

**Research and Economic Analysis Division
Department of Business, Economic Development, and Tourism
May 1997**

This report has been cataloged as follows:

Hawaii. Dept. of Business, Economic Development, and Tourism. Research and Economic Analysis Division.

Population and economic projections for the State of Hawaii to 2020 (DBEDT 2020 series); report of results and methodology. Honolulu: Dept. of Business, Economic Development, and Tourism, State of Hawaii, 1997.

1. Population forecasting-Hawaii. 2. Employment forecasting-Hawaii. 3. Economic forecasting-Hawaii. 4. Hawaii-Economic conditions-Mathematical models.

HB3730.H66.1997

TABLE OF CONTENTS

List of Figures	v
List of Tables	vii
Foreword	ix
1. Summary of Projections	1
Population	1
Gross State Product and Final Demand.....	6
Output.....	8
Employment.....	8
Personal Income.....	9
2. Hawaii Population and Economic Projection and Simulation Model	11
Overview of the State Submodel	11
Final Demand.....	13
Consumption	14
Private Investment in Structures.....	15
Other Private Investment.....	15
Government Spending.....	15
Exports.....	16
Imports	16
Output.....	16
Employment.....	17
Income.....	19
Population	20
3. The County Allocation Submodel.....	22
4. Tourism Projections.....	25
Overview of DBEDT Tourism Projections Process	26
Trend Analysis	26
Projections for the Major Market Segments	28
Expert Opinion.....	29
Tourism Allocation Model.....	29

5.	Demographic Data and Assumptions	34
	Population Data	34
	Life Tables and Survival Rates.....	34
	Projected Survival Rates.....	35
	Fertility Rates	36
Appendix A.	State Economic and Population Projections	39
Appendix B.	County Economic and Population Projections	45
Appendix C.	State and County Tourism Projections	51
Appendix D.	Projections of Population by Age, Sex, and Military Status	59
Appendix E.	Equation Listing for the State and County Submodels	67
Appendix F.	Database for Final Demand Submodel.....	85
Appendix G.	Database for Output Submodel.....	89
Appendix H.	Database for Employment Submodel	97
Appendix I.	Database for Income Submodel.....	99
Appendix J.	Database for Population Submodel	103
Appendix K.	Database for County Allocation Submodel.....	121

List of Figures

Figure 1-1. Projected Age Distribution for the Resident Population of Hawaii, 1995 and 2020	5
Figure 1-2. Average Annual Growth of Hawaii Real Gross State Product, 1970–2020.....	7
Figure 1-3. Average Annual Growth of Civilian Jobs, 1970–2020	8
Figure 1-4. Growth in Real Personal Income, 1970–2020	9
Figure 2-1. Structure of Hawaii Long-Range Economic and Population Projection and Simulation Model.....	12
Figure 3-1. Structure of the County Allocation Submodel.....	23
Figure 4-1. Actual and Projected Annual Growth of Visitor Arrivals, 1970–2020.....	26
Figure 4-2. Calculation of Daily Visitor Census and Visitor Expenditures for the State.....	30
Figure 4-3. Calculation of Daily Visitor Census and Hotel/Condo Units by County	33
Figure 5-1. 1990 Survival Rates for Males.....	35
Figure 5-2. 1990 Survival Rates for Females	36

List of Tables

Table 1-1. Resident and De Facto Population by Status, 1980–2020	2
Table 1-2a. Resident Population by County, 1980–2020	3
Table 1-2b. De Facto Population by County, 1980–2020	4
Table 1-3. Components of Change in the Civilian Population, 1995–2020	4
Table 1-4a. Projection of Selected State and County Variables, 1995–2020	6
Table 1-4b. Growth Rate for Selected State and County Variables, 1995–2020	7
Table 4-1. Projections for Key Visitor Variables, 1995–2020	25
Table 4-2. Visitor Projections by Market	28
Table A-1. Hawaii State Gross State Product	40
Table A-2. Hawaii State Output	41
Table A-3. Hawaii State Employment	42
Table A-4. Hawaii State Personal Income	43
Table A-5. Hawaii State Population	44
Table B-1. City & County of Honolulu: Population, Personal Income, and Employment	46
Table B-2. Maui County: Population, Personal Income, and Employment	47
Table B-3. Hawaii County: Population, Personal Income, and Employment	48
Table B-4. Kauai County: Population, Personal Income, and Employment	49
Table C-1. Projections of Visitor Variables, 1995–2020	52
Table C-2. Actual and Forecasts of Japanese and Non-Japanese Visitors, 1970–2020	56
Table C-3. Actual and Forecasts of Westbound and Eastbound Visitors, 1970–2020	56
Table C-4. Per Capita Japanese and U.S. Visitor Expenditures and the Yen/Dollar Exchange Rate, 1986–1994	57
Table C-5. Visitor Arrivals and Average Length of Stay, 1980–1995	57
Table C-6. Visitor Rooms by County, 1965–1996	58
Table D-1. Hawaii State Population Projection, 1995	60
Table D-2. Hawaii State Population Projection, 2000	61
Table D-3. Hawaii State Population Projection, 2005	62
Table D-4. Hawaii State Population Projection, 2010	63
Table D-5. Hawaii State Population Projection, 2015	64

List of Tables (cont.)

Table D-6. Hawaii State Population Projection, 2020.....	65
Table F-1. Hawaii Final Demand and Population, 1970–1995	86
Table F-2. Exogenous Variables.....	87
Table G-1. Hawaii State Output.....	90
Table G-2. Final Demand Coefficients	91
Table G-3. 1987 Total Requirement Coefficients	92
Table G-4. Output Adjustment for 1995	95
Table H-1. Hawaii State Wage and Salary Employment.....	98
Table H-2. Hawaii State Output-Job Ratio.....	98
Table I-1. Hawaii State Personal Income	100
Table I-2. Hawaii State Labor Income	101
Table I-3. Hawaii State Income-Job Ratio.....	101
Table I-4. Income-Job Ratio and Income Increasing Factor.....	102
Table J-1. Estimation of 1995 Population	104
Table J-2. Hawaii Life Table for Males, 1990.....	106
Table J-3. Hawaii Life Table for Females, 1990.....	110
Table J-4. 1990 and 1995 Survival Rates for Hawaii.....	114
Table J-5. Fertility Rates for Other Civilian Females, 1990 and 1995.....	117
Table J-6. Net Migration and Migrant Distribution for Other Civilians by Age and Sex, 1980 to 1992	118
Table J-7. Other Civilians: Population, Births, Deaths, and Net Migration, 1960–1995	119
Table K-1. Honolulu County: Population, Income, and Jobs.....	122
Table K-2. Maui County: Population, Income, and Jobs	124
Table K-3. Hawaii County: Population, Income, and Jobs.....	126
Table K-4. Kauai County: Population, Income, and Jobs	128

Foreword

It gives me great pleasure to present the results and methodology of the DBEDT 2020 forecasts. The DBEDT 2020 Projections represent an extension into the future of important trends affecting Hawaii, with the help of some basic assumptions about how those trends appear to be changing. It provides policymakers, business and the public with a base scenario for growth and change of the state's economy and population over the next quarter century. With this knowledge about how economic and demographic forces are shaping the future, the people of Hawaii can make judgments about the desirability of that future and either plan for it, or try to alter it to one that is more desirable.

Thus, these projections do not represent preferences for the future, nor are they necessarily unalterable if they are deemed undesirable. It is our hope that they will serve as a basis for renewed examination of where trends are taking Hawaii and how we might shape our state's future for the benefit of ourselves and our children.

DBEDT has prepared and updated long-range projections of Hawaii's economy and population for nearly two decades, beginning with the IIF Series in 1978. This new set of projections replaces the M-K series which was released in 1988. With each update of the long-range projections, DBEDT has introduced improvements in methods, data, and technique that enhance the value and use of the projections. The new projections are no exception. The assumptions, methods, data and results of this fourth major release of long-range projections are presented in the report.

I would like to acknowledge the efforts of the Research and Economic Analysis Division for the production of the DBEDT 2020 Series Projections and this report, particularly the work of Dr. Xijun Tian. Additionally, I would like to thank the many individuals and agencies that have commented on earlier versions of the report.

Seiji F. Naya
Director
Department of Business, Economic
Development, and Tourism

1. SUMMARY OF PROJECTIONS

This report presents the results and methodology of the DBEDT 2020 series, long-range population and economic projections for Hawaii. For nearly two decades, the State Department of Business, Economic Development, and Tourism (DBEDT) has prepared long-range forecasts of Hawaii's economy and population using the Hawaii Population and Economic Projection and Simulation Model. Three reports on the long-range projection have been published since 1978. The first report was published in 1978 and covered the period between 1975 and 2000 (II-F series). The second report was published in 1984 and covered the period from 1980 to 2005 (M-F series). The third report was published in 1988 and covered the 25-year period between 1985 and 2010 (M-K series). The DBEDT 2020 series extends the projection period to the year 2020. In deriving the new projections, the Hawaii Population and Economic Projection and Simulation Model has been reviewed and modified by consultants and the staff of the Research and Economic Analysis Division to improve its performance.

It is important to note that these projections are neither targets nor goals. Rather, they represent DBEDT's best estimates for the likely path of important population and economic variables based on currently available information. The projections were made without imposing future supply constraints and are designed to capture long-term trends rather than short-term, cyclical changes in the economy. The long-term trend provides a relatively objective baseline expectation for the future. The accuracy of the projections will depend upon changing external conditions, infrastructure capacity and other supply constraints which have not been incorporated into the modeling process. Accuracy also depends upon future policy decisions, which cannot be adequately modeled.

Section 1 of this report presents the forecasts of population and economic variables at both the state and county levels. Section 2 describes the state submodels. Section 3 introduces the county allocation methodologies. Section 4 describes tourism projections. Section 5 presents assumptions and methodologies used in deriving the population projections. Appendices A through K present detailed data tables relating to the topics discussed.

POPULATION

As presented in Table 1-1, the resident population of Hawaii, which includes members of the armed forces and their dependents but excludes visitors, is projected to rise from 1.18 million in mid-1995 to 1.49 million in mid-2020, an average annual

1.0 percent increase from 1995. The de facto population, which includes visitors present but excludes residents temporarily absent, is projected to grow from 1.29 million in 1995 to 1.72 million in 2020. The growth rates of both the resident and de facto populations are expected to be lower from 1995 to 2020 than they were between 1980 and 1995.

Table 1-1. Resident and De Facto Population by Status, 1980–2020				
Year	Resident population 1/		De facto population 2/	
	Total	Excluding armed forces and dependents	Total	Visitors present
Population (thousands)				
1980	968.5	846.5	1,055.4	96.5
1985	1,039.7	919.0	1,138.0	116.7
1990	1,112.9	997.0	1,257.0	162.1
1995	1,179.2	1,070.9	1,287.1	158.4
2000	1,238.5	1,130.3	1,372.8	187.4
2005	1,304.0	1,195.8	1,463.0	214.9
2010	1,366.7	1,258.5	1,548.6	240.5
2015	1,430.5	1,322.3	1,633.3	264.1
2020	1,494.1	1,385.9	1,720.2	290.1
Average annual percent change				
1980 - 1985	1.4	1.7	1.5	3.9
1985 - 1990	1.4	1.6	2.0	6.8
1990 - 1995	1.2	1.4	0.5	-0.5
1995 - 2000	1.0	1.1	1.3	3.4
2000 - 2005	1.0	1.1	1.3	2.8
2005 - 2010	0.9	1.0	1.1	2.3
2010 - 2015	0.9	1.0	1.1	1.9
2015 - 2020	0.9	0.9	1.0	1.9

1/ As of July 1. The resident population is defined as the number of persons whose usual place of residence is in an area, regardless of physical location on the census or estimate date. It includes armed forces stationed or homeported in an area but excludes persons of local origin attending school or in military service outside the area.

2/ The de facto population is defined as the number of persons physically present in an area, regardless of usual place of residence. It includes visitors present but excludes residents temporarily absent. The resident population is based on July 1 estimates; visitors present and residents absent are based on calendar year averages.

Tables 1-2a and 1-3b present the projections of resident and de facto population by county. The Neighbor Islands are projected to have higher population growth rates than Oahu. Resident population on Oahu is projected to rise from 870,900 in 1995 to 1,050,600 in 2020, an average 0.8 percent increase annually for the next 25 years. The Neighbor Islands' resident population is projected to rise from 308,400 in 1995 to 443,600 in 2020, a 1.5 percent annual average growth for the period. Because of their faster population growth, the Neighbor Islands are expected to account for 29.7 percent of the state's resident population by 2020, up from 26.2 percent in 1995.

Table 1-2a. Resident Population by County, 1980–2020 (Thousands)						
Year	State	City & County of Honolulu	Other counties			
			Total	Hawaii	Kauai	Maui
Resident population (thousands)						
1980	968.5	764.6	203.9	92.9	39.4	71.6
1985	1,039.7	804.3	235.4	105.9	44.4	85.1
1990	1,112.9	838.2	274.7	121.5	51.6	101.6
1995	1,179.2	870.9	308.4	137.2	56.0	115.2
2000	1,238.5	904.0	334.5	149.6	60.9	124.0
2005	1,304.0	944.0	360.0	160.6	66.6	132.8
2010	1,366.7	980.0	386.8	173.9	72.0	140.9
2015	1,430.5	1,016.0	414.4	189.1	77.3	148.0
2020	1,494.1	1,050.6	443.6	205.4	82.8	155.4
Average annual percent change						
1980 - 1985	1.4	1.0	2.9	2.7	2.4	3.5
1985 - 1990	1.4	0.8	3.1	2.8	3.1	3.6
1990 - 1995	1.2	0.8	2.3	2.5	1.7	2.5
1995 - 2000	1.0	0.7	1.6	1.7	1.7	1.5
2000 - 2005	1.0	0.9	1.5	1.4	1.8	1.4
2005 - 2010	0.9	0.8	1.4	1.6	1.6	1.2
2010 - 2015	0.9	0.7	1.4	1.7	1.4	1.0
2015 - 2020	0.9	0.7	1.4	1.7	1.4	1.0

Hawaii County is projected to have a resident population of 205,400 in 2020, representing a 1.6 percent annual increase during the 1995–2020 period. This implies that Hawaii County's share of the total state population will be 13.7 percent by 2020, up from 11.6 percent in 1995. Kauai County is projected to have 82,800 residents by 2020, representing a 1.6 percent annual increase from 1995; they would account for 5.5 percent of the total state population, up from 4.7 percent in 1995. Maui County would have 155,400 residents by 2020, a 1.2 percent annual increase from 1995. This would give Maui County 10.4 percent of the state's resident population by 2020, up from 9.8 percent in 1995.

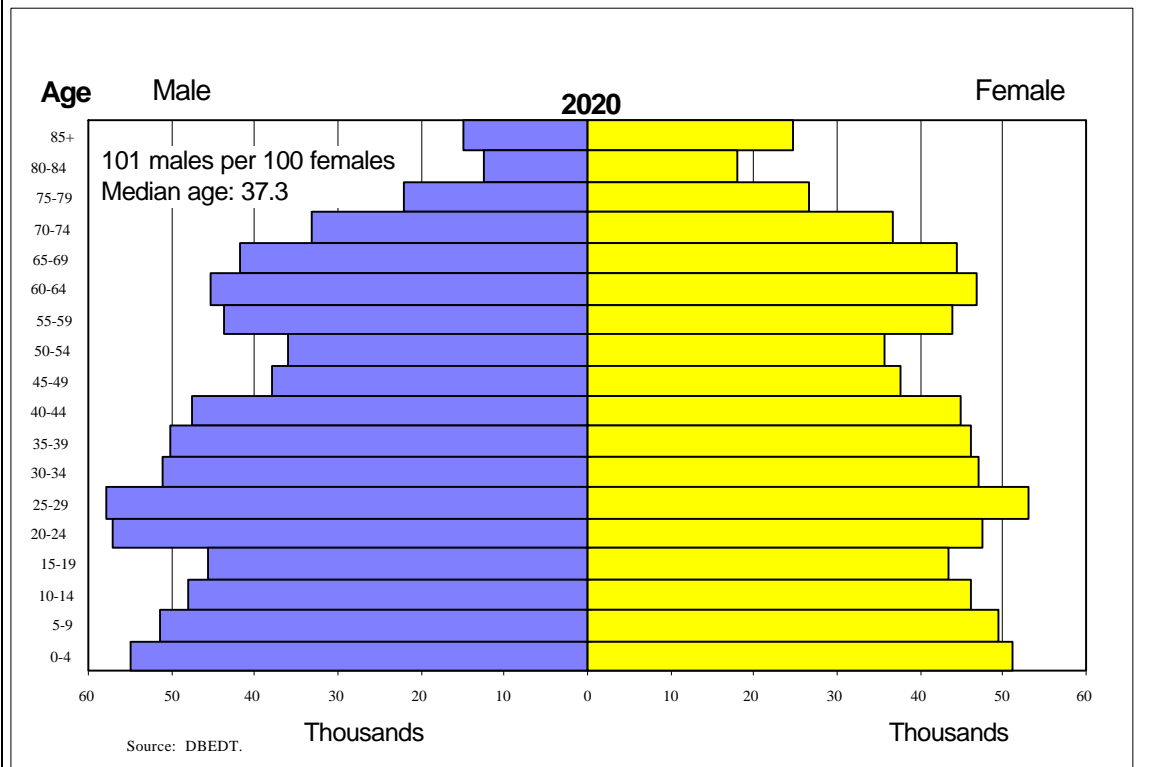
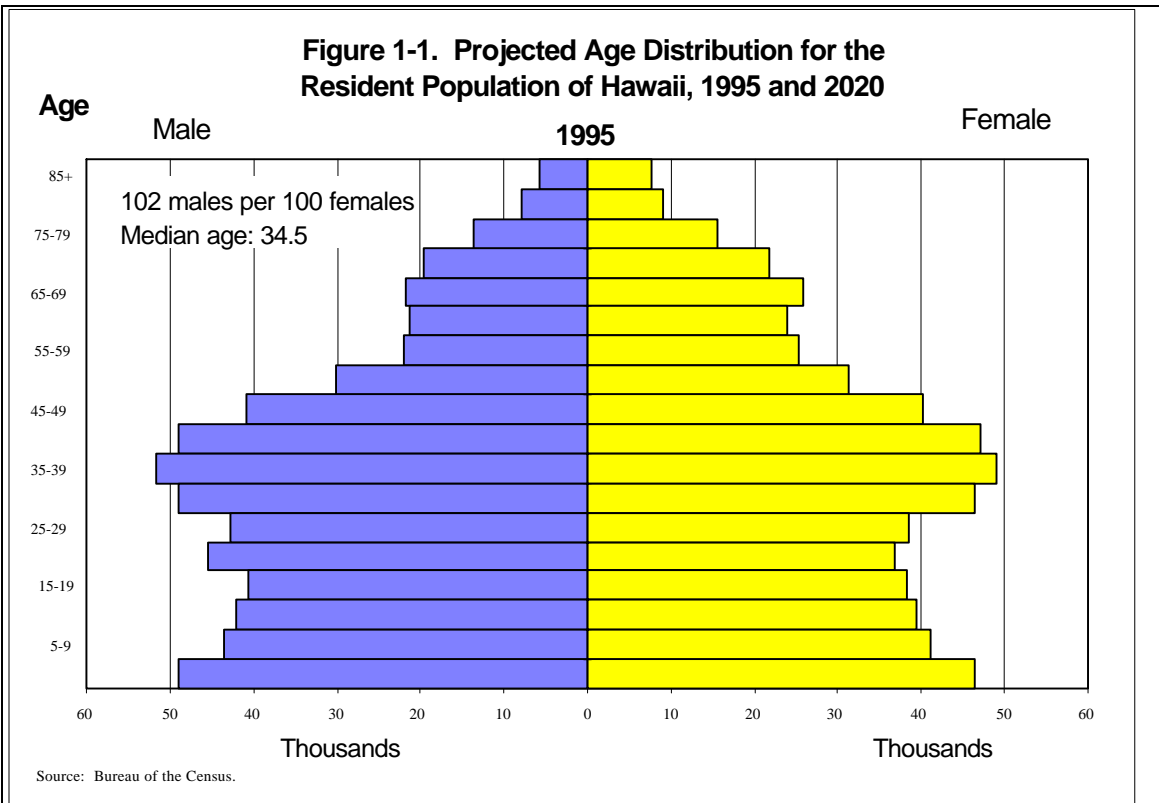
As presented in Table 1-3, projected net migration is about 4,500 per year from 1995 to 2000, and an average 6,400 per year between 2000 and 2020. This level of net migration is lower than experienced in the previous 35 years and is mainly due to a slower rate of projected economic growth.

Table 1-2b. De Facto Population by County, 1980-2020						
Year	State	City & County of Honolulu	Other counties			
			Total	Hawaii	Kauai	Maui
De facto population (thousands)						
1980	1,055.4	823.4	232.1	99.3	46.4	86.4
1985	1,138.0	855.0	282.9	112.5	55.3	115.1
1990	1,257.0	912.1	345.0	136.5	69.0	139.5
1995	1,287.1	915.4	371.9	149.7	69.3	152.8
2000	1,372.8	959.2	413.8	165.9	78.8	169.0
2005	1,463.0	1,007.0	456.2	181.9	89.5	184.8
2010	1,548.6	1,048.9	500.0	200.4	100.1	199.5
2015	1,633.3	1,090.3	543.2	220.9	109.6	212.7
2020	1,720.2	1,130.6	589.8	243.3	119.7	226.7
Average annual percent change						
1980 - 1985	1.5	0.8	4.0	2.5	3.6	5.9
1985 - 1990	2.0	1.3	4.0	3.9	4.5	3.9
1990 - 1995	0.5	0.1	1.5	1.9	0.1	1.8
1995 - 2000	1.3	0.9	2.2	2.1	2.6	2.0
2000 - 2005	1.3	1.0	2.0	1.9	2.6	1.8
2005 - 2010	1.1	0.8	1.9	2.0	2.3	1.5
2010 - 2015	1.1	0.8	1.7	2.0	1.8	1.3
2015 - 2020	1.0	0.7	1.7	2.0	1.8	1.3

Table 1-3. Components of Change in the Civilian Population, 1995–2020				
(annual average for the period)				
Period	Population change ¹	Births	Deaths	Net migration
1995 - 2000	12,000	15,300	7,800	4,500
2000 - 2005	13,100	15,700	9,100	6,500
2005 - 2010	12,700	16,700	10,200	6,200
2010 - 2015	12,800	17,800	11,300	6,300
2015 - 2020	12,800	18,500	12,100	6,400

¹ Equals births minus deaths plus net migration.

Figure 1-1 depicts changes in the age structure of Hawaii's population between 1995 and 2020.



A longer life expectancy will cause an aging of Hawaii's population, with the median age rising from 34.5 years in 1995 to 37.3 years in 2020. The population under age 15 is projected to decline from 22.2 percent of the total population in 1995 to 20.1 percent over the next 25 years. The number of persons 65 years old and over is projected to grow nearly twofold by 2020, from 12.6 percent of the total population in 1995 to 18.4 percent in 2020. Summary projections of state population by selected characteristics may be found in Appendix A, Table A-5. County population projections are contained in Appendix B. Detailed population projections by age and sex distribution and their shares for each five-year interval of the projection period are provided in Appendix D.

GROSS STATE PRODUCT AND FINAL DEMAND

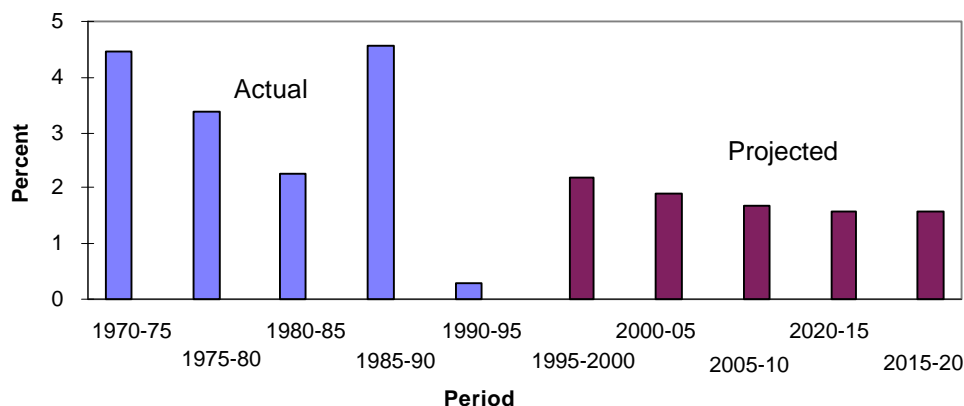
Tables 1-4a and 1-4b present selected demographic and economic projections for the state and counties. The projections anticipate slower economic growth than in the past. The annual average growth of real (i.e., inflation adjusted) Gross State Product (GSP), which is the value of all final goods and services produced in Hawaii, was 4.3 percent from 1958 to 1995. The annual average real GSP growth from 1995 to 2020 is projected to be 1.8 percent.

Table 1-4a. Projection of Selected State and County Variables, 1995–2020						
	1995	2000	2005	2010	2015	2020
State						
Gross state product (mils. \$87)	23,297.8	25,994.7	28,548.0	31,052.3	33,588.9	36,388.5
Population (thous.)	1,179.2	1,238.5	1,304.0	1,366.7	1,430.5	1,494.1
Civilian labor force (thous.)	579.8	613.2	650.8	687.3	721.9	757.4
Civilian unemployment rate (%)	5.9	4.6	4.8	5.1	5.0	4.7
Total civilian jobs (thous.)	576.5	619.4	656.8	692.3	728.8	767.3
Personal income (mils. \$87)	21,255.6	23,671.7	25,902.1	28,305.7	31,051.8	34,105.1
Honolulu County						
Population (thous.)	870.9	904.0	944.0	980.0	1,016.0	1,050.6
Personal income (mils. \$87)	16,622.0	18,363.0	19,982.9	21,701.5	23,670.0	25,841.0
Total civilian jobs (thous.)	431.9	459.6	482.4	502.9	524.6	546.8
Maui County						
Population (thous.)	115.2	124.0	132.8	140.9	148.0	155.4
Personal income (mils. \$87)	1,955.5	2,240.8	2,500.8	2,774.2	3,066.8	3,397.9
Total civilian jobs (thous.)	61.8	67.3	72.7	77.5	81.8	87.1
Hawaii County						
Population (thous.)	137.2	149.6	160.6	173.9	189.1	205.4
Personal income (mils. \$87)	1,806.7	2,054.0	2,260.3	2,515.2	2,824.7	3,176.2
Total civilian jobs (thous.)	56.8	62.4	68.0	74.0	81.1	88.9
Kauai County						
Population (thous.)	56.0	60.9	66.6	72.0	77.3	82.8
Personal income (mils. \$87)	871.5	1,014.1	1,158.0	1,314.8	1,490.1	1,689.9
Total civilian jobs (thous.)	26.8	30.3	34.1	37.9	41.1	45.0

Table 1-4b. Growth Rate for Selected State and County Variables, 1995–2020 (average annual growth rate for period)					
	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
State					
Gross state product	2.2	1.9	1.7	1.6	1.6
Population	1.0	1.0	0.9	0.9	0.9
Civilian labor force	1.1	1.2	1.1	1.0	1.0
Total civilian jobs	1.4	1.2	1.1	1.0	1.0
Personal income	2.2	1.8	1.8	1.9	1.9
Honolulu County					
Population	0.7	0.9	0.8	0.7	0.7
Personal income	2.0	1.7	1.7	1.8	1.8
Total civilian jobs	1.2	1.0	0.8	0.8	0.8
Maui County					
Population	1.5	1.4	1.2	1.0	1.0
Personal income	2.8	2.2	2.1	2.0	2.1
Total civilian jobs	1.7	1.6	1.3	1.1	1.3
Hawaii County					
Population	1.7	1.4	1.6	1.7	1.7
Personal income	2.6	1.9	2.2	2.3	2.4
Total civilian jobs	1.9	1.7	1.7	1.8	1.9
Kauai County					
Population	1.7	1.8	1.6	1.4	1.4
Personal income	3.1	2.7	2.6	2.5	2.5
Total civilian jobs	2.5	2.4	2.1	1.6	1.8

Figure 1-2 shows the actual and projected average growth rate of GSP. The slower economic growth in the projection period is mainly due to less vigorous growth of exports, which is the driving force for regional growth, as well as the slowdown in the long-term rate of investment. Growth in the state's major export activity, tourism, is expected to decline from 3.7 percent a year between 1995 and 2000 in terms of real visitor expenditures, to 2.1 percent between 2010 and 2020. Projections for tourism are discussed in Section IV.

Figure 1-2. Average Annual Growth of Hawaii Real Gross State Product, 1970–2020



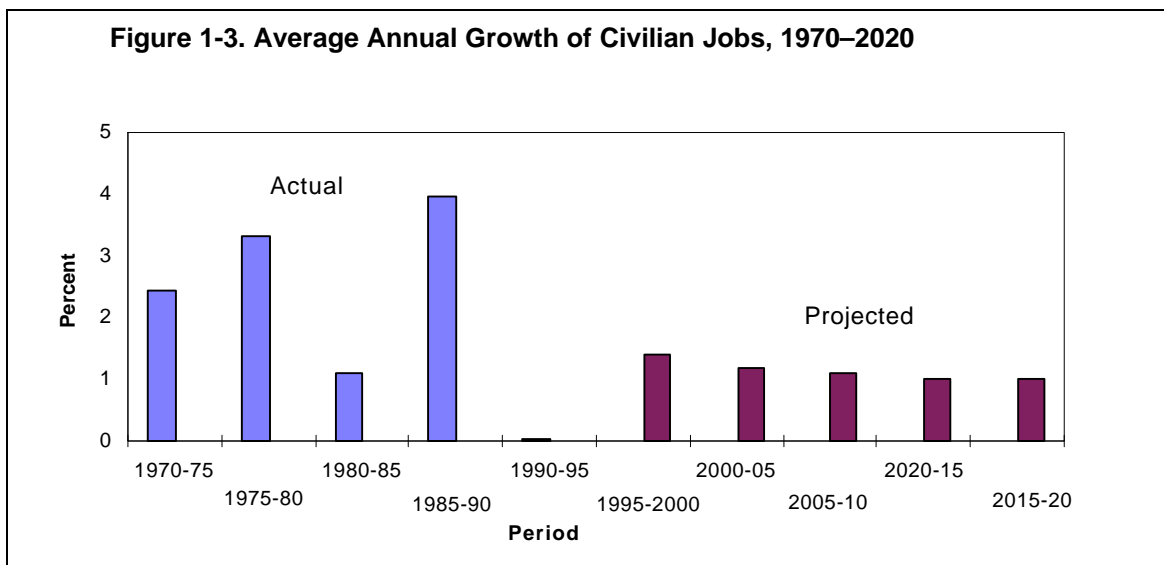
Personal consumption expenditures are expected to grow an average 1.9 percent annually from 1995. Investment in structures, which includes new construction and additions and alterations, is expected to decline slightly between 1995 and 2000, and then remain roughly constant in real terms for the rest of the projection period. Federal defense expenditures will likely expand at less than 1.0 percent annually. Non-tourism exports, which include goods shipped out-of-state and services provided to out-of-state consumers, are expected to grow an average annual growth rate of 1.8 percent. Imports should grow at an average 2.1 percent per year over the projection period. More detailed projections of state final demand are contained in Appendix A.

OUTPUT

Total output, which is the value of both final and intermediate goods and services in Hawaii, is expected to grow at an average annual rate of 2.1 percent over the next 25 years. Output in transportation, communication and utilities, eating and drinking places, trade, hotels, services other than hotels, and government enterprises (post offices) are expected to grow at more than 2.0 percent per year. Output in agriculture, manufacturing, construction, and finance, insurance and real estate are projected to grow at annual average rates below 2.0 percent. Detailed output projections by industry are presented in Appendix A.

EMPLOYMENT

The state's total civilian labor force is projected to reach 757,400 by 2020, a 30.6 percent increase from the 1995 level. The working age population, consisting of persons 16 years old and over, is expected to reach 1.12 million in 2020, a 31.2 percent increase from 1995. There are projected to be 767,300 civilian jobs by 2020, compared to 576,500 in 1995, representing an average annual growth of 1.2 percent. Figure 1-3 shows the historical and projected average annual growth of total civilian jobs.

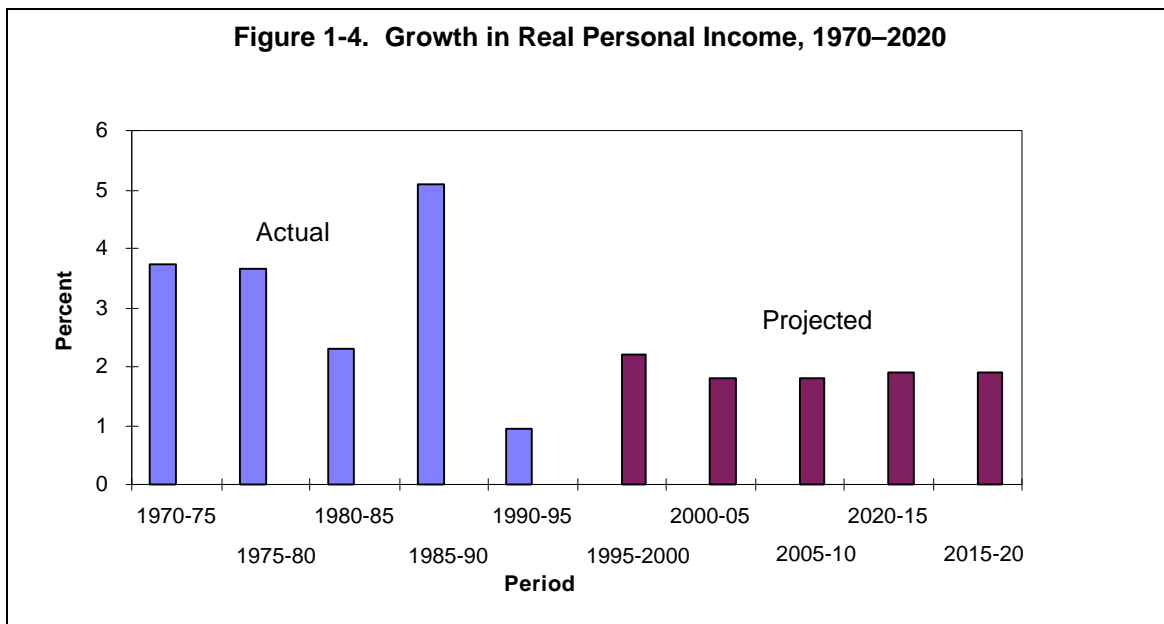


The number of employed persons will reach 721,500 by 2020, up 32.2 percent from 1995. The long-term unemployment rate will vary between 4.6 to 5.1 percent, and the labor force participation rate will vary between 67.1 and 67.7 percent over the 25 years of the projection. Projections on statewide labor force and employment by industry are provided in Appendix A.

Honolulu County's share of statewide jobs will likely fall relative to the Neighbor Islands. Honolulu is projected to have 546,800 civilian jobs in 2020 which would represent 71.3 percent of state total civilian jobs, down from 74.9 percent in 1995. Maui County is projected to have 87,100 civilian jobs. This would amount to 11.4 percent of statewide civilian jobs projected for 2020, up from 10.7 percent in 1995. Hawaii County is expected to have 88,900 civilian jobs, or 11.6 percent of statewide civilian jobs in 2020, up from 9.8 percent in 1995. Kauai County is expected to have 45,000 civilian jobs, 5.9 percent of statewide civilian jobs, and up from 4.6 percent in 1995. County employment projections by industry are provided in Appendix B.

PERSONAL INCOME

As suggested in Figure 1-4, state personal income is projected to grow at an average annual rate of 1.9 percent from 1995 to 2020. Consequently, real per capita personal income should rise by an average 0.9 percent per year. Within the personal income category, transfer payments are projected to grow faster than labor income because of the aging population. Transfer payments are expected to constitute 18.5 percent of total personal income in 2020, up from 16.3 percent in 1995. By contrast, the share of labor income will drop from 72.4 percent of personal income to 70.3 percent over the same period. Detailed projections on personal income are provided in Appendix A.



Among the counties, Honolulu is expected to account for 75.8 percent of statewide personal income by 2020, down from 78.2 percent in 1995. Honolulu's per capita personal income would be 107.8 percent of the state average, up from 105.9 percent in 1995.

Maui County is projected to have 10.0 percent of state personal income by 2020, up from 9.2 percent in 1995. Maui's per capita personal income would be 95.8 percent of the state average, up from 94.2 percent in 1995. Hawaii County is expected to have 9.3 percent of statewide personal income in 2020, up from 8.5 percent in 1995. The Big Island's per capita personal income would be 67.8 percent of the state average, down from 73.1 percent in 1995. Kauai County's share of statewide personal income is projected to be 5.0 percent, up from 4.1 percent in 1995. Kauai's per capita personal income would be 89.4 percent of the state average, up from 86.4 percent in 1995. County personal income projections are presented in Appendix B.

2. HAWAII POPULATION AND ECONOMIC PROJECTION AND SIMULATION MODEL

The DBEDT 2020 Series projections were produced through the Hawaii Population and Economic Projection and Simulation Model, which was developed by the Department in 1978 and refined over the years. It is an interindustry econometric model that generates economic and demographic forecasts for the state and its counties at five-year intervals for the projection period. Previous versions of the model contained sets of recursive equations in which each endogenous variable depended on either exogenous or lagged endogenous variables. The model was originally written in APL computer language and was stored in the Wylbur System at the University of Hawaii Computing Center. Since both APL language and the Wylbur system have become obsolete, a major modification of the model was undertaken in 1994.

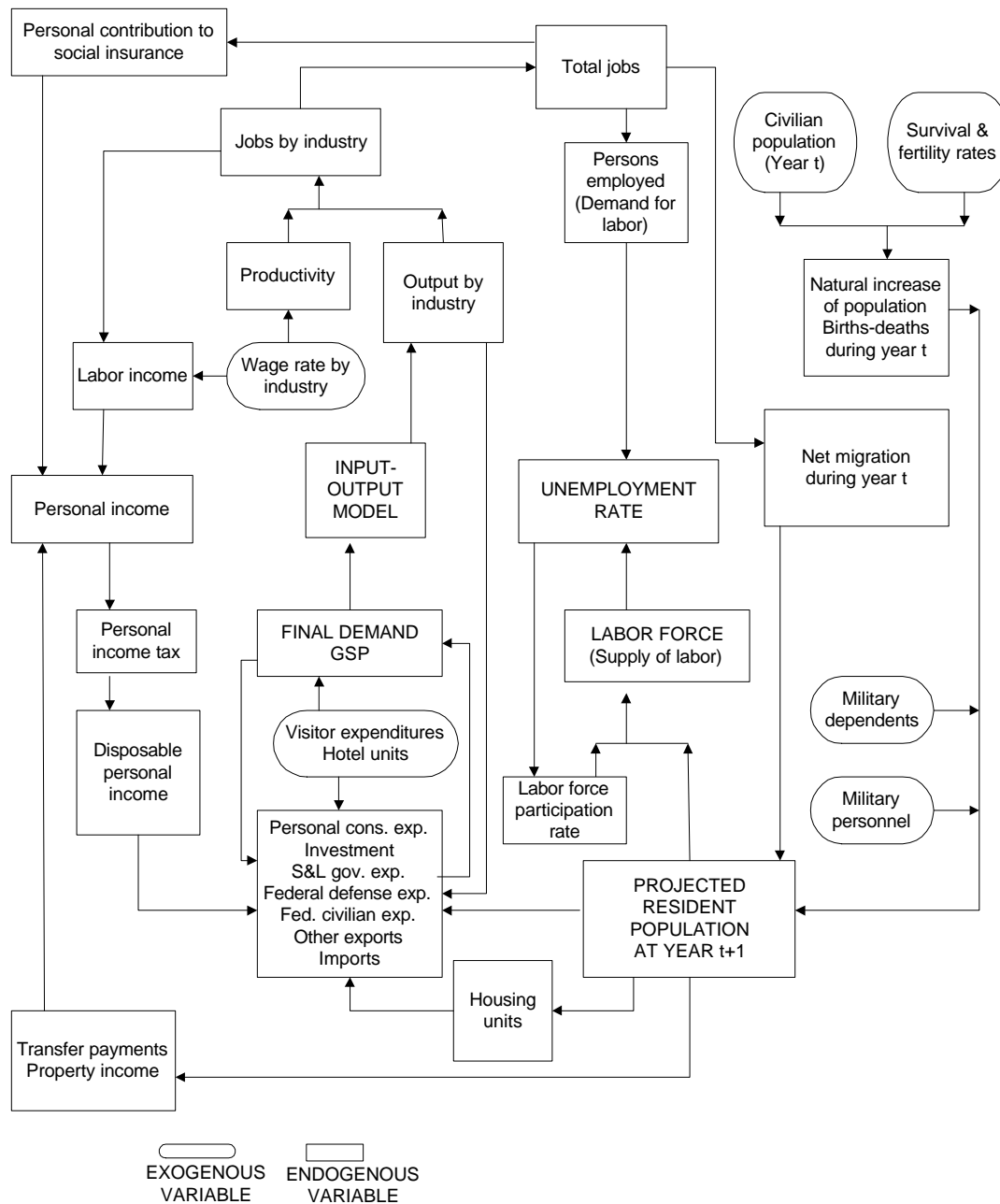
In order to produce more accurate forecasts and to incorporate the recommendations and comments made by consultants and users of the forecasts, the Research and Economic Analysis Division modified the model with the following features: (1) the model was rewritten as a C++ program; (2) the model program has been rewritten to handle simultaneous equations, using the Gauss-Seidel search procedure to solve the equations; (3) all equations in the model have been re-estimated using data available as of November 1996 and many of the equations include current-year endogenous variables as explanatory variables; (4) net migration is now derived from an equation based on the change in the total number of jobs in Hawaii and migration levels in the previous three years; (5) the civilian unemployment rate is now derived from a model based on economic conditions rather than assuming a constant rate of 5.0 percent; (6) civilian persons employed is now derived by an equation rather than assuming a constant ratio between persons employed and total jobs.

After modification, the model consists of a set of simultaneous equations. It makes predictions of 415 variables using 282 behavioral equations and 2,134 exogenous variables, coefficients, and ratios. The model contains two second-level submodels: the state submodel and the county submodel. The state submodel generates statewide projections, and the county submodel allocates the state projections to the four counties.

OVERVIEW OF THE STATE SUBMODEL

As presented in Figure 2-1, the state submodel contains five major blocks or tertiary (third-level) models: final demand, income, output, employment, and population. All of the variables in the state model, including all the tertiary models, are projected by

Figure 2-1. Structure of Hawaii Long-Range Economic and Population Projection and Simulation Model



simultaneous equations. The final demand components are projected by a set of equations or are exogenously given. Final demand is allocated to each industry by multiplying by the final demand coefficients derived from the 1987 State Input-Output Model, which is also maintained by DBEDT. The output of each industry is derived by multiplying the industry's final demand by its corresponding coefficient in the total requirements matrix of the input-output model. Jobs are derived by dividing each industry's output by the industry's productivity factor. Higher productivity means more

output per job and thus, fewer new jobs are required to increase output by a given amount. Once jobs are determined, labor income is derived by multiplying jobs by the income-job ratio for the industry. Income, again, acts as an independent variable in the final demand equations.

Population is derived by a cohort component procedure based on the 1995 population distribution and projected survival rates and fertility rates. There are three linkages between the population tertiary model and the other components of the model. The first linkage is through the net migration equation which links employment and population. Net migration depends on current-year and previous-year job levels. In this relationship, the economy partly influences population through the demand for labor and, consequently, net labor migration which adds to population. The second linkage is through transfer payments and property income equations which link population and income. Transfer payments depend on the population 65 years and over, and the number of people unemployed. Property income, which includes dividends, interest and rental income, is a function of the total current population level. Thus, in this relationship, population influences the economy. The third linkage is through the structural investment equation. Investment in structures depends on the number of housing units built, while the number of housing units built depends on growth of the population. Here, again, population influences the economy; in this case through investment.

The state component of the model identifies 20 industries. For each industry, projections are made for output, employment, and labor income. Other variables projected by the state submodel include personal consumption expenditures, private investment, state and local government expenditures, exports (including visitor expenditures), civilian labor force, the unemployment rate, population, and average annual deaths, births, and net migration.

The equations in the model were estimated using Econometric Views ("E. Views"), developed by the firm Quantitative Micro Software. The equations were based on time-series data from 1970 to 1995. The equations and other projection inputs were then programmed in the C++ language to produce the final projections. The projection results were copied to Excel spreadsheets to be formatted into tables and charts. Each of the tertiary models is described more fully below.

FINAL DEMAND

Based on the national income accounting principle, gross state product (GSP) is measured by the following identity:

$$\text{GSP} = \text{C} + \text{I} + \text{G} + \text{X} - \text{M}$$

where:

GSP = Gross state product

C = Personal consumption expenditures

I = Private investment

G = Government spending, including government investment

X = Exports

M = Imports

Each component of GSP may consist of many items. The model divides private investment into “investment in structures” and “other investment.” Government spending includes Federal defense construction; other Federal defense; Federal civilian, state and local government construction; and state and local government non-construction spending. Exports are divided into visitor expenditures and non-tourism exports. The final demand items projected are as follows:

- Consumption: Personal consumption expenditures
- Investment: Private investment in structures
 Other private investment
- Government spending: State and local government construction
 State and local government other expenditures
 Federal defense construction
 Federal defense other expenditures
 Federal civilian expenditures
- Exports: Visitor expenditures
 Non-tourism exports
- Imports

Consumption

Consistent with the classical consumption function, the personal consumption expenditures component is modeled to depend primarily on disposable personal income. It also depends on past consumption and the previous year's income level.

Private Investment In Structures

Private investment in structures includes construction of residential buildings, and non-residential buildings such as hotels, offices, stores, and additions and alterations of existing structures. Repairs to buildings and structures are classified as consumption rather than investment. Building permit data from 1970 to 1995 show that residential and hotel construction accounted for about 70 percent of the investment in structures over the last 25 years. Therefore, investment in structures is modeled by using the growth in private residential housing and hotel units. Hotel units include condominiums used by visitors. The growth in residential housing depends on the growth of the resident population and changes in average household size. Increases in population, coupled with decreases in household size, result in disproportionately greater demand for housing units. And, in fact, the ratio between population and housing units has been declining, from 3.6 in 1970 to 2.9 in 1995. Based on past trends, the population-housing unit ratio is assumed to decline 0.02 every five years. Residential housing unit demand is calculated by dividing population by the assumed population-housing unit ratio.

Housing units include not only privately developed projects, but also government-provided affordable housing units. Federally developed housing units are assumed to remain constant at the 1995 level of 21,000 units. This assumption is consistent with the fact that the number of Federal housing units has been fairly constant since 1980. The number of state and local government provided housing units are modeled to depend on the population level. Total resident housing units minus government units equals private resident housing units.

The growth of hotel units depends on the growth of the visitor industry, as measured by the daily visitor census and hotel occupancy rates. The projection of hotel units is described in Section IV. Thus, investment in structures depends on both population and visitor activity.

Other Private Investment

Other private investment includes the purchase of machinery and equipment, such as airplanes, automobiles, agricultural machinery, construction machinery, computer equipment, etc. This investment is modeled as a function of disposable personal income.

Government Spending

Government construction—both Federal defense and state and local government construction—is assumed to remain constant at the 1995 level. This assumption is based on the past 15-year trend in government construction.

Exports

Visitor expenditures were projected exogenously, and the detailed description of the methodology used is given in Chapter 4. Non-tourism exports for each industry depend on industry output. In deriving the non-tourism exports, no constraints are assumed in production capacity except for agriculture. Sugar is assumed to grow on 56,600 acres of land which are located on Maui and Kauai. This is the acreage after the closing of Ka'u Agribusiness sugar plantation on the Big Island, Waialua Sugar and Oahu Sugar on Oahu, and McBryde Sugar on Kauai in 1996. No further abrupt decline in sugar acreage is assumed; however, the historical decline in sugar industry activity is reflected in the trend projection. Similarly, no abrupt change in pineapple acreage is assumed through the projection period. Sugar processing and pineapple processing are assumed to follow the same trend as sugarcane and fresh pineapple production.

Imports

Imports in the final demand model depend primarily on disposable personal income, and, to a lesser extent, previous levels of imports and income.

The equations of the final demand model are presented in Appendix E, and the data base for estimating the equations is in Appendix F.

OUTPUT

Continuous, historical output data by industry are not available for Hawaii. The U.S. Bureau of the Census publishes industry output at five-year intervals, but with a three-year lag. The most recent Census industry output data are for 1992. Since 1977, DBEDT has updated its Input-Output (I-O) model following each release of output data by the Bureau.

An I-O model is a mathematical representation of the economy. The core of the I-O model is a matrix presenting the flows of goods and services among industries, and from industry to final users, exports, and imports. The latest Hawaii I-O model update is for 1987. The 1992 Hawaii State I-O model update is currently underway and is expected to be completed by May 1997. To identify any structural changes in Hawaii's economy and to estimate the base year (1995) output, 1995 industry outputs were estimated using 1987 industry outputs. Output by industry was then updated to 1995 using the rate of growth in labor income for the industry. In mathematical form, the 1995 output of industry i is represented by the following formula:

$$\text{OUTPUT}_{95,i} = \text{OUTPUT}_{87,i} \times \frac{\text{LINCOME}_{95,i}}{\text{LINCOME}_{87,i}}$$

where:

$OUTPUT_{95,i}$ = Estimated 1995 output of industry i

$OUTPUT_{87,i}$ = 1987 output of industry i

$LINCOME_{95,i}$ = Labor income earned in 1995 from industry i

$LINCOME_{87,i}$ = Labor income earned in 1987 from industry i , and i is any one of the 20 industries used in the model.

Labor income includes wages and salaries, other labor income (of which fringe benefits are the major component), and proprietors' income. Labor income data are estimated by the Bureau of Economic Analysis of the U.S. Department of Commerce and are released every quarter with about a five-month lag. The estimated 1995 output is presented in Appendix G, Table G-1.

There are two steps in projecting future output: (1) allocating the final demand to each industry using the final demand coefficient derived from the state I-O model; and (2) converting each industry's final demand into the industry's output using the total requirement coefficients, also derived from the state I-O model. The final demand coefficients are listed in Table G-2, and the total requirement matrix is given in Table G-3 of Appendix G. Although the I-O model is based on 1987 data, there have been structural changes in Hawaii's economy between 1987 and 1995. Thus, the output derived by converting final demand estimates of the I-O model into total output estimates using I-O relationships is different from the output estimated more directly using labor income growth rates. Therefore, output is adjusted using an output adjustment factor. The output adjustment factor is calculated to be the difference between the output derived from the I-O model and the output estimated using labor income growth rate. The output adjustment factors are listed in Table G-4 in Appendix G. The mathematical presentation of the output submodel is presented in Appendix E.

EMPLOYMENT

Employment is defined as the average *number of people* who are employed full-time or part-time in a given year. Jobs, on the other hand, are defined as the average *number of positions*, full-time or part-time, in a given year. If a person has two part-time positions in two different companies, the person would be counted once in the employment count, but twice in the job count. Therefore, the job count invariably exceeds the employment count because of multiple-job holders.

Labor force and employment data are estimated through the Current Population (household) Survey (CPS) conducted monthly by the Bureau of the Census. Job data used in this projection are based on business establishment data submitted to the

Hawaii State Department of Labor and Industrial Relations (DLIR). Both data are published in DLIR's monthly *Labor Area News* and its annual *Labor Force Data Book*. The U.S. Bureau of Economic Analysis (BEA) also publishes state and county job data. BEA's job data differ from those of DLIR due to differences in reporting periods and industry scope, as well as the number of self-employed workers by industry. DLIR data are used in this projection series because of local familiarity and timeliness.

Jobs are divided into wage and salary jobs and self-employed. Wage and salary jobs are available at the 2-digit industry level of the Standard Industry Classification (SIC) system. However, self-employed jobs are not available by industry. Wage and salary jobs in each industry, except state and local government jobs, are derived by dividing the industry's output-job ratio into the industry output derived from the output submodel. The 1995 output-job ratio (a measure of productivity) is derived by dividing the industry's wage and salary jobs into the industry's output. Table H-1 in Appendix H shows 1995 wage and salary jobs by industry, while Table H-2 gives the output-job ratios for 1995. Future output-job ratios are projected by multiplying the previous year's ratio with a productivity factor. The productivity factor is assumed to equal income growth. The reasoning behind this assumption is that wages and salaries can only grow in the long-run at the rate of productivity. Income growth is described in the income model section of this chapter.

Agricultural wage and salary jobs are expected to remain level at 8,000 jobs after 2000. Between 1995 and 2000, some former sugar workers will find jobs in diversified agriculture. This would increase agriculture jobs from the current 7,500 level to 8,000 by 2000. Jobs will continue to increase in visitor-related industries such as eating and drinking places and hotels.

State and local government jobs are derived by assuming no change from the current level to 2005. The increase in jobs will then be proportionate to population growth at 60 jobs per 1,000 resident population. This is about the level experienced in the 1970s and early 1980s.

Self-employed jobs are modeled to depend on wage and salary jobs. Increases in wage and salary jobs are assumed to lead to an increase in self-employed jobs. The labor force is calculated by the population model as the product of the working age population and the labor force participation rate. The working age population is defined as the number of people 16 years of age and above. The labor force participation rate is defined as the percent of the population 16 years of age and above who are working or looking for work. The labor force participation rate is modeled to depend on the previous year's unemployment rate and the previous year's labor force participation rate. This specification is consistent with Hawaii's experience. For example, the labor force participation rate in Hawaii declined from 70.1 percent in 1992 when the unemployment rate was 4.6 percent, to 67.6 percent in 1995 when the unemployment rate was 5.9

percent. The mathematical presentation of the employment submodel is presented in Appendix E.

INCOME

Personal income data used in the projections are estimates released by the BEA in September 1996. The data, which are from 1969 to 1995, were divided by the price deflator for personal consumption expenditures to convert the data series into 1987 constant dollars. Table I-1 in Appendix I presents the personal income data series in 1987 dollars. The model first forecasts each of four major personal income components including:

(1) labor income, which includes wage and salaries, other labor income, and proprietors' income; (2) transfer payments, which include social security payments, unemployment insurance payments, and Federal assistance payments; (3) property income, which includes dividends, interest, and rental income; and (4) personal contributions to social insurance, which is withholding from wage and salaries for Federal social security and Medicare programs. Personal income is then calculated as:

$$\begin{aligned} \text{Personal income} = & \text{Labor income} + \text{transfer payments} + \text{property income} \\ & - \text{personal contributions to social insurance} \end{aligned}$$

Labor income is projected at the industry level by multiplying the industry's projected wage and salary jobs by its income-job ratio. Wage and salary jobs are derived from the employment model. The income-job ratio for 1995 was calculated as the quotient of labor income earned in an industry divided by the industry's wage and salary job count. Labor income for 1995 by industry is presented in Table I-2 of Appendix I, while Table I-3 lists the income-job ratios. Future income-job ratios were projected to be the product of the previous year's ratio multiplied by an income-increasing factor. The income increasing factors used in this projection are the average increasing factors between 1970 and 1995. This causes per worker labor income to increase at the same rate as in the 1970 to 1995 period.

Transfer payments are modeled to depend on the population 65 years of age and above, as well as the number of people unemployed. Property income depends on the population level. Personal contribution to social insurance depends on the number of wage and salary jobs.

Personal income tax and non-tax payments, which include all tax payments to federal, state and county governments, are modeled using an equation with total personal in-

come as the independent variable. Disposable income is calculated to be the difference between total personal income and personal taxes. Disposable personal income is an independent variable in most of the final demand equations. The estimated equations of the income model are listed in Appendix E.

POPULATION

The resident population was divided into three major components: military personnel, military dependents, and other civilians. The number of military personnel and their dependents stationed in Hawaii is mainly the result of national defense considerations, with the state's economic situation having little impact. Since the end of the Cold War and the Persian Gulf War, the military population in Hawaii has declined. In 1995, there were 50,700 uniformed military personnel stationed in Hawaii, the lowest number in the last 15 years. Because of Hawaii's strategic location, the number of armed forces personnel in Hawaii is not projected to fall further. In this forecast, military personnel are assumed to remain constant in number at the 1995 level for the next 25 years. Military personnel move among military bases frequently, with their dependents. Military dependents are also assumed to remain at a constant level of 63,000 for the next 25 years.

The other civilians component is projected using the cohort-component method. This method has four steps: (1) project total births in a year by multiplying the other civilian female population from 14 years old to 49 years old by their childbearing rates; (2) project total other civilian deaths in a year by multiplying each age group of that population by its survival rate; (3) project net migration of other civilians in a year by the migration equation, and allocate the migrants into each age group according to migration distribution coefficients; and (4) calculate the other civilian population using the following formula:

$$\text{CIVILIAN}_{t,i} = \text{CIVILIAN}_{t-1,i} + \text{BIRTHS}_t - \text{DEATHS}_{t,i} + \text{NETMIG}_{t,i}$$

where:

$\text{CIVILIAN}_{t,i}$ = Number of other civilians at age i in year t

$\text{CIVILIAN}_{t-1,i}$ = Number of other civilians at age i in year $t-1$

BIRTHS_t = Number of newborn babies in year t

$\text{DEATH}_{t,i}$ = Number of other civilians deceased at age i in year t

$\text{NETMIG}_{t,i}$ = Number of migrants at age i in year t

Section V provides greater detail on the methodology of calculating the survival and fertility rates.

Historical net migration was calculated as the residual between other civilian population change and natural increase, and can be expressed by the following formula:

$$\text{NETMIG}_{t,i} = \text{CIVILIAN}_{t,i} - \text{CIVILIAN}_{t-1,i} + \text{BIRTHS}_t - \text{DEATHS}_{t,i}$$

Since population figures are reported as of July 1 of each year while births and deaths are reported as calendar-year totals, births and deaths are averaged between two calendar years to approximate mid-year measures. The estimated net migration is presented in Table J-7 of Appendix J.

Data show that Hawaii has generally had net in-migration. The state experienced net out-migration in only 5 of the last 35 years. In the past 35 years, Hawaii absorbed an average 7,240 net migrants each year. The trend shows that net migration had two peaks over the past 35 years, one in the late 1960s and the other in the late 1980s, that occurred during economic boom years. The magnitude of the second peak is smaller and narrower than the first one. The trend indicates that net migration is declining on average.

To allocate migrants to each age group and by gender, the projection used the average age and sex distribution between 1980 and 1992. The net migrant distribution is presented in Table J-6 in Appendix J.

Net migration depends in the model on growth of jobs in the state and previous levels of net migration. The results suggest that more people will move to Hawaii in a given year if the state experienced in-migration in the previous two years. However, more people will move out of the state if the migrants came to the state three years ago. Increases in jobs tend to bring more migrants.

De facto population consists of three components: resident population, residents temporarily absent, and daily visitors present in the state. Resident population is projected in the population submodel. Hawaii Visitors and Convention Bureau (HVCB) survey data on returning residents are used to estimate residents temporarily absent. The average ratio of residents temporarily absent to the resident population between 1992 and 1995 was used for projections of this component. The average ratio between 1992 and 1995 was used because HVCB changed the visitor survey methodology in 1992, making the results inconsistent with data prior to 1992. The number of daily visitors present in Hawaii are projected in a separate tourism model which is described in Section IV of this report. A mathematical presentation of the population submodel is given in Appendix E.

3. THE COUNTY ALLOCATION SUBMODEL

Most of the county projections for population and economic activity represent allocations of comparable statewide projections using the County Allocation Submodel. The exceptions are of visitors and visitor rooms, which were allocated to the counties in an integrated tourism projections process discussed in the next section of this report.

The primary purpose of allocating the projections to the county level is to translate the generalized statewide projections into more specific implications for the geographically diverse regions of the state. This helps planners, policymakers, and businesses understand the potential impacts of the statewide projections for specific counties.

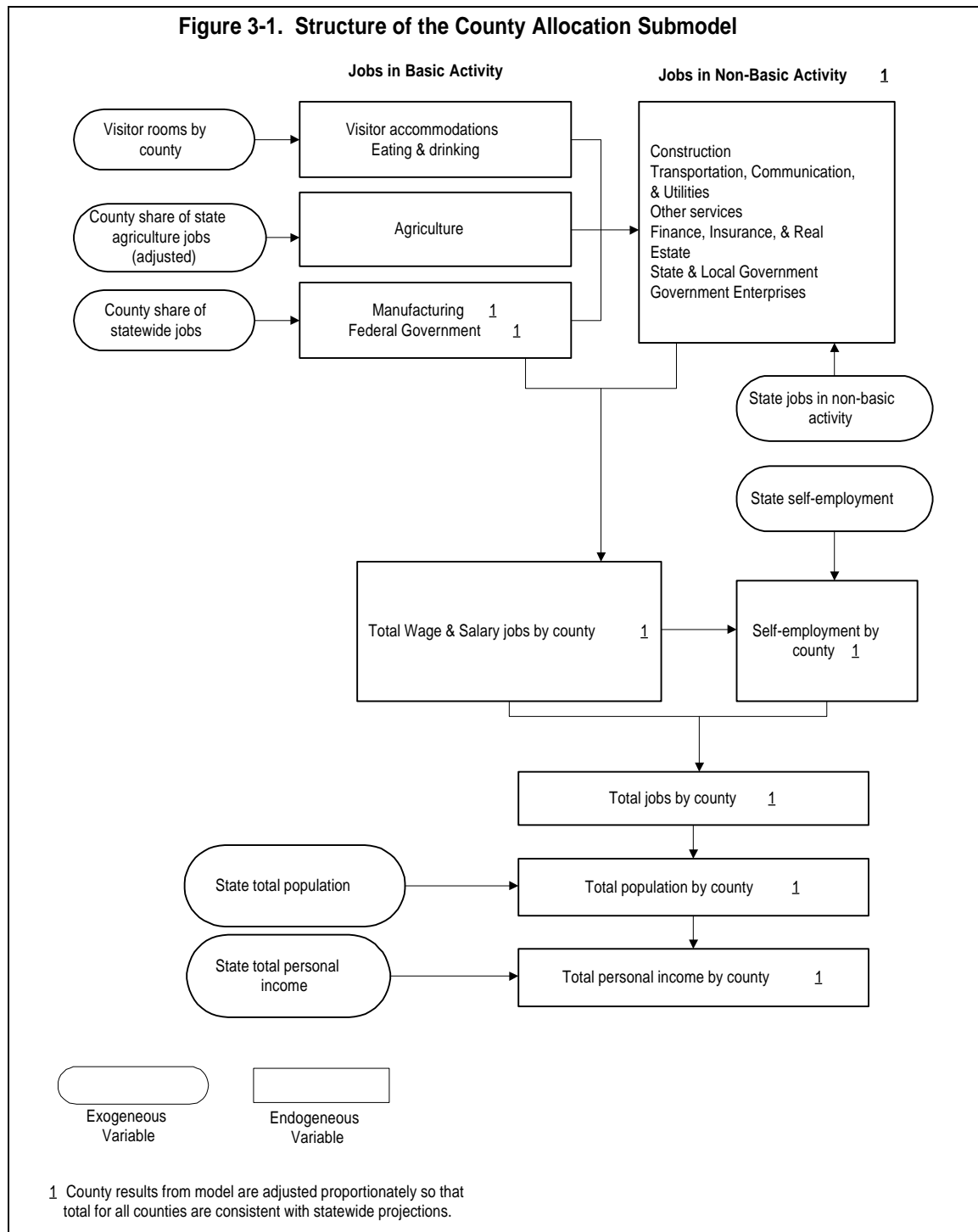
The caveats noted earlier for the state-level projections are even more important in interpreting the results of the county allocations. This is because the accuracy of the county allocations will depend not only on the accuracy of the statewide projections but also on supply conditions in each county as well as future county land use and infrastructure policies—factors which have not been, or cannot be, modeled. Thus, these county level projections should not be viewed as predictions for individual geographical areas, but rather as illustrations of the results that may be anticipated if the statewide projections are reasonably accurate and current county trends continue.

The allocation model makes use of the *basic* and *nonbasic* industries concept of regional economic growth theory. This concept holds that certain *basic* economic activity—such as exports, agriculture and other primary production—drives (causes) growth in other *nonbasic* sectors of the region's economy. Thus, as exports and primary economic activities grow, *nonbasic* activity such as retailing and local service activity can be expected to expand more or less proportionately.

Figure 3-1 describes the general process followed in the County Allocation Submodel. As shown, the model utilizes a number of exogenous (external) variables that have been developed elsewhere in the projections process. The endogenous (internal) variables are products of the model itself. The essential strategy of the model is to estimate each county's future share of statewide *basic* economic activity, then calculate what additional *nonbasic* activity might be generated in each county. The resulting projections of total economic activity are then used to estimate county shares of state population and income. The submodel, whose equations are described in detail in Appendix E, is based on a 25-year trend in the growth and statewide share of 17 important county economic and population variables.

Tourism, agriculture, manufacturing, and Federal government activity constitute the *basic* economic sectors in the counties. As Figure 3-1 shows, the allocation process

begins with the projection of jobs in the *basic* industries of each county. Jobs associated with visitor room facilities (hotels and visitor condominiums) were estimated on the basis of projected hotel rooms by county (see Section 4 for details on county visitor industry projections). Manufacturing and Federal jobs by county were projected based on trend analysis of each county's share of jobs in these activities statewide.



The county shares of statewide agriculture wage and salary jobs, which includes forestry and fisheries, reflect some special assumptions based on recent changes in the number of sugar operations. As indicated in the previous section, it is assumed that statewide, agriculture will experience some increase in jobs between 1995 and 2000 (about 500) as certain lands formerly used for sugar growing are converted to other agricultural uses.

Thereafter, the level of agricultural jobs is held constant at about 8,000 due to uncertainty about further declines in sugar and pineapple growing versus growth in diversified agriculture. For county projection purposes, additions to agricultural jobs by 2000 are assumed to occur in Hawaii County and on Oahu, due to the large amounts of recently vacated sugar lands that are now available for diversified agricultural crops and forestry activity. The agriculture job count is held constant for each county after the year 2000.

Nonbasic industries at the county level were defined as construction; transportation, communication, and utilities; trade (except eating and drinking); finance, insurance, and real estate; services (except hotels and other visitor room facilities); government enterprises, and state and local government. The county projections for jobs in each *nonbasic* industry were estimated as a function of total *basic* sector jobs and, in certain cases, the relationship between *basic* and *nonbasic* jobs at the state level. County projections for self-employment were derived as a function of total wage and salary jobs. Finally, the sum of jobs by industry for all counties was compared with previously projected statewide jobs by industry and proportionate adjustments were made to each county's job count by industry to ensure consistency with statewide projections. The exceptions to this adjustment process were jobs in visitor room facilities, eating and drinking, and agriculture, which were exogenously determined for the state and counties.

Projected state-level population was allocated to the counties using equations based on the past relationship of jobs and population for the county and anticipated changes in the jobs-to-population ratio at the state level. Similarly, projected state personal income was allocated to the counties through equations based on the relationship of population and income at both the county and state levels. As in the case of jobs, the county totals for population and income were adjusted proportionately to be consistent with previously projected state totals for these variables.

4. TOURISM PROJECTIONS

Summary projections for key tourism variables used in the DBEDT 2020 series projections are shown in Table 4-1. Tourism growth is the most important factor determining future levels of population and employment in Hawaii. The tourism projections underlying the DBEDT 2020 series reflect a combination of trend analyses and relationship modeling. These techniques are discussed in this section, as are the resulting projections and the methods used to allocate statewide tourism at the county level.

Table 4-1. Projections for Key Visitor Variables, 1995–2020

Year	1995	2000	2005	2010	2015	2020
Visitor arrivals (thousands)	6,629.2	7,873.4	9,127.4	10,326.9	11,401.7	12,588.4
Ave. percent change, prev. 5 yrs.	-	3.5	3.0	2.5	2.0	2.0
Average length of stay (days)	8.7	8.7	8.6	8.5	8.5	8.4
Average daily visitor census (1,000)	158.4	187.4	214.9	240.5	264.1	290.1
Ave. percent change, prev. 5 yrs.	-	3.4	2.8	2.3	1.9	1.9
Visitor expenditures (millions of 1987 dollars)	8,347.1	9,998.4	11,578.2	13,085.0	14,490.6	16,047.0
Ave. percent change, prev. 5 -yrs.	-	3.7	3.0	2.5	2.1	2.1
Number of hotel units	69,764	78,546	86,208	92,853	101,121	111,142
Ave. percent change, prev. 5 yrs.	-	2.4	1.9	1.5	1.7	1.9
Hotel occupancy rate (percent)	76	77	78	78	79	79

More detailed data on tourism variables used in the projections process, including the county allocation results, are contained in Appendix C.

The table shows that the long-term trend of declining growth in total visitor arrivals to Hawaii is projected to continue for about the next 15 years, before stabilizing at a rate roughly equal to the rate of economic growth in Hawaii's major visitor markets. In the 1995–2000 period, the rate is projected to average 3.5 percent per year, falling gradually to an average 2.0 percent per year after 2010, at which point it is projected to stabilize.

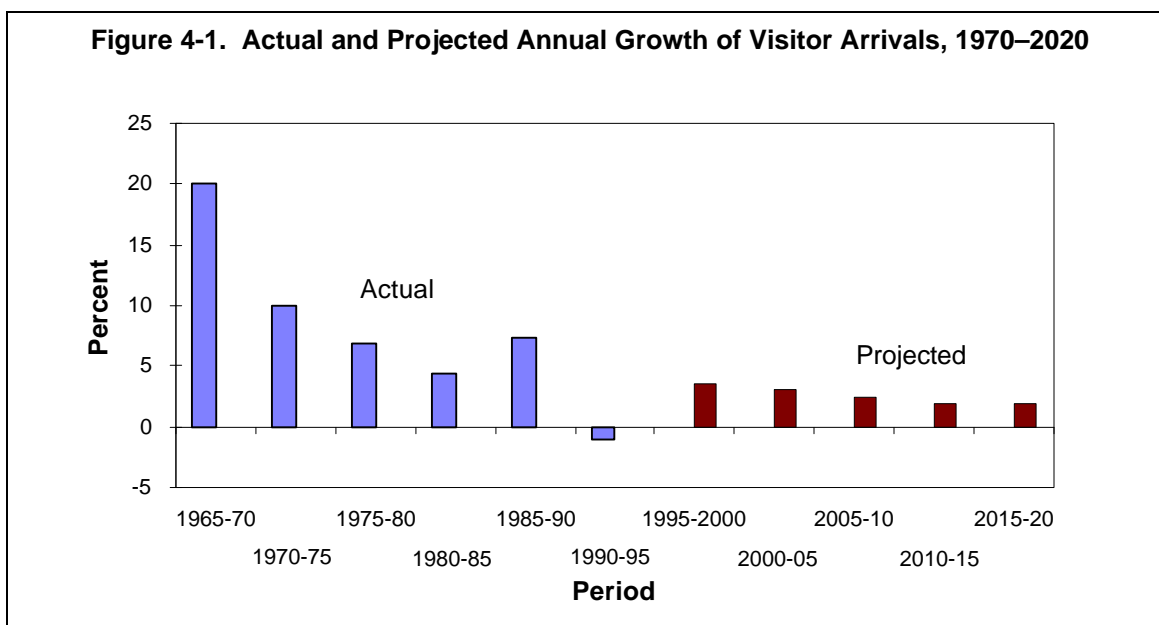
The result of this projected growth is an increase in the average annual count of visitor arrivals from 6.6 million in 1995 to about 10.3 million by 2010 and 12.6 million by 2020. This represents a less vigorous rate of visitor arrival growth than contained in the department's previous M-K series projections which projected the number of visitor arrivals to reach 11.5 million in 2010, the final year of the M-K series projection period.

OVERVIEW OF DBEDT TOURISM PROJECTIONS PROCESS

The visitor projections adopted for the DBEDT 2020 projection series resulted from analyses of long-range tourism market growth trends and relationships that govern such factors as the average daily visitor census, intensity in the use of visitor accommodations, and the distribution of tourism by county. In the first stage of the process, historical trend analysis, substantiated by expert opinion, provided the underlying growth rates for tourism to the state by the major markets and direction of travel. In the second stage, the growth rate projections were translated into more concrete projections for such factors as the visitor census, visitor spending, the demand for visitor accommodations, and the hypothetical distribution of tourism by county.

TREND ANALYSIS

Figure 4-1 provides a visual depiction of the actual and projected average annual growth rate for tourism arrivals for five-year periods from 1965 to 2020. It shows that the *growth rate* of tourism arrivals has been declining since the 1960s except for the 1985–1990 period. From 1985 to 1990, strong tourism demand from the expanding Japan market pushed growth above the long-term trend. However, beginning with the Persian Gulf War in 1991, Hawaii experienced a number of supply-side and demand-side problems that caused the growth rate to plummet in the early 1990s. These problems included the loss of most rooms on Kauai for a period of time due to Hurricane Iniki in 1992, and the U.S. recession that occurred at about the same time and was especially severe and prolonged for California, one of Hawaii's key visitor markets.



In addition to slower economic activity and the loss of visitor rooms, the data between 1985 and 1995 reflect statistical problems that have clouded the actual trend for these years. The statistical difficulties stem from a 1992 change to certain key questions in the in-flight survey of passengers arriving in Hawaii on westbound flights, which is conducted by the Hawaii Visitors and Convention Bureau (HVCB). This survey is the basis for determining the visitor count. The change resulted in as many as 400,000 more passengers per year counted as returning residents after 1992, rather than as visitors. Thus data for this period are less reliable than earlier periods for establishing the long-run trend.

The historical data indicate that while the growth rate of visitor arrivals has been falling, the number of additional visitors has averaged about one million in each five-year period from 1965 to 1985. The increase from 1985 to 1990 amounted to nearly 2.1 million visitors. Even after adjusting for the inconsistencies in the 1990 to 1995 data, it is likely that the true visitor count increased only about 100,000 for the five-year period, if at all.

The declining rate of growth in the demand for Hawaii tourism is consistent with the life cycle of many products in the market. However, Hawaii's visitor industry is not as easily analyzed as a single product in a single market.

The complexities of the market, coupled with a rather limited data set for key variables, help to explain why Hawaii tourism is a very difficult quantity to project through equation modeling. Thus, trend analysis is relied upon for developing the long-range tourism growth rate projections.

One of the relationships (revealed through econometric analysis) that can assist in long-range tourism projections is that of visitor arrival growth and the growth of the relevant national economy. This relationship can also be referred to as the elasticity of visitor arrivals with respect to economic growth. In 1970, the elasticity was about 3.0; that is, all other things being equal, visitor arrivals could be expected to increase 3 percent for every 1 percent increase in the nation's Gross Domestic Product (GDP). By 1995 the elasticity had declined to about 1.5 for both the U.S. and Japan markets.

Taking this and other information into account, the long-run growth rate in the demand for Hawaii tourism, as measured by visitor arrivals, is expected to continue declining by about one-half percentage point on average in each of the five-year periods through 2010. From 2010 to 2020, arrivals are projected to increase at an average 2.0 percent per year, or roughly the same long-run growth rate as the economy as a whole. In economic terms this rate reflects an elasticity of 1.0 with respect to economic growth. These growth rates imply that the visitor count will continue to increase at a fairly constant rate of about 1.2 million visitors every five years from 1995 to 2020. This rate of increase is consistent with the overall 1965 to 1990 trend.

PROJECTIONS FOR THE MAJOR MARKET SEGMENTS

Trend analysis was also used to allocate total projected tourism growth among the major market segments and by direction of travel. While Hawaii tourism is diversifying into newer, emerging markets, the traditional markets of the U.S. mainland, particularly California, and Japan are likely to continue to represent the bulk of the visitor count over the next two decades or more. While growth has slowed considerably over the past decade in the U.S. market, the Japan market is still growing at a healthy long-run pace.

Table 4-2 presents arrival and market share projections for Japanese and non-Japanese visitors to Hawaii, and in the westbound and eastbound directions of travel. While the growth rates of all submarkets have declined over time, the Japan and eastbound markets have continued to gain market share over the non-Japanese markets and westbound direction because of the difference in growth rates.

Table 4-2. Visitor Projections by Market						
Market	1995	2000	2005	2010	2015	2020
Arrivals (thousands)						
Total	6,629.2	7,873.4	9,127.4	10,326.9	11,401.7	12,588.4
Japanese	1,998.9	2,519.5	3,012.1	3,511.1	3,990.6	4,531.8
Non-Japanese	4,630.3	5,353.9	6,115.4	6,815.7	7,411.1	8,056.6
Eastbound	2,696.1	3,306.8	4,016.1	4,750.4	5,358.8	6,042.4
Westbound	3,933.1	4,566.6	5,111.4	5,576.5	6,042.9	6,546.0
Share (percent)						
Japanese	30.2	32.0	33.0	34.0	35.0	36.0
Non-Japanese	69.8	68.0	67.0	66.0	65.0	64.0
Eastbound	40.7	42.0	44.0	46.0	47.0	48.0
Westbound	59.3	58.0	56.0	54.0	53.0	52.0

Examination of the national trend indicates that the current 30 percent share of total visitor arrivals held by Japan will probably continue to increase throughout the projections period to about 36 percent by 2020. In terms of actual numbers, arrivals from Japan is expected to rise from about 2.0 million in 1995 to 4.5 million by 2020. This projection assumes continued growth in Japan's economy and leisure travel market. The share of total visitor arrivals accounted for by eastbound visitors, which is dominated by the Japan market, is projected to increase from its current 41 percent share of total visitor arrivals to 48 percent by the year 2020.

Japan's share of the Hawaii arrival market is not expected to expand as fast during the projections period as it has in the past. Much of the expansion in market share over the past several decades has been due to the continuous appreciation of the Japanese yen. However, the yen is not expected to show nearly as much appreciation in the future. The yen's value more than tripled with respect to the dollar between 1970 and 1995, increasing from 360 yen to about 110 yen per U.S. dollar during the period. The east-bound share of the visitor market is projected to grow by 7 percentage points, slightly higher than the 6 percentage points increase expected in the share of Japanese visitors by the year 2020. This difference reflects higher growth in emerging Asian markets such as Korea and Taiwan.

The results of the additional trend analyses were used to translate the overall visitor arrival growth projections into more specific visitor industry measures. These results and trends will be discussed in a section in the tourism allocation model.

EXPERT OPINION

One method of checking the reasonableness of an analytical forecast is to compare it with the opinion of experts on the subject matter. In early 1996, DBEDT commissioned a survey of experts in the various tourism markets by SMS Research. The results suggest that visitor arrivals will continue to increase, although at a declining rate, to about 12 million visitors to Hawaii in the year 2020. This is within 600,000 visitors or 5 percent of the DBEDT projection for 2020, suggesting that the latter is in reasonable agreement with independent expert industry opinion.

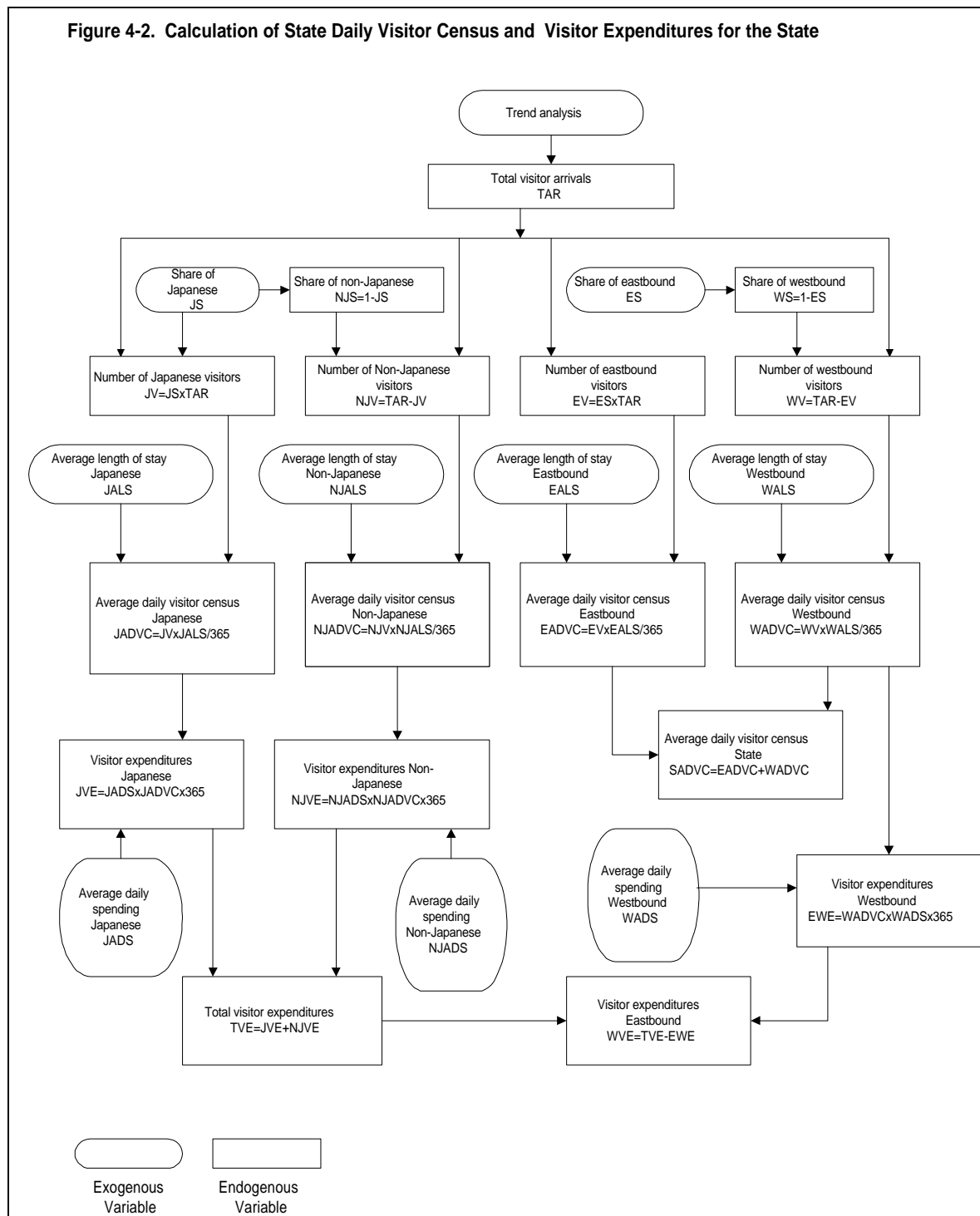
TOURISM ALLOCATION MODEL

An allocation model was used to translate the results of the trend analysis into more specific tourism variables. These variables include the average daily visitor census, visitor expenditures, occupied and total visitor units (primarily hotels and resort condominiums), and the allocation of visitor activity by county.

As depicted in Figure 4-1, the model first estimates projected Japanese/non-Japanese and westbound/eastbound arrivals using the projections for total visitors and the market shares of those particular segments developed through the trend analysis. The average daily visitor census for the market segments depends on both the number of arrivals and the average length of stay by visitors. The long-run, average length of stay through 2020 was assumed to be 6 days for eastbound visitors, and 10.5 days for westbound visitors. These lengths of stay have been relatively stable since the mid- to late 1980s. The average length of stay for Japanese visitors was also assumed to be 6 days. The long-run length of stay for non-Japanese visitors was assumed to decline slightly from 9.9 days in 1995 to 9.8 days in 2020, mainly due to the increasing proportion over time of non-Japanese, eastbound visitors for whom the average length of stay is shorter than most other market segments. The average daily visitor census for each segment

was estimated by multiplying the average length of stay by the number of visitors and dividing by 365 days. The visitor census is a key measure for the industry and underlies the projections for the remainder of the visitor-related variables developed through the allocation model.

Figure 4-2. Calculation of State Daily Visitor Census and Visitor Expenditures for the State



Visitor expenditure projections are developed by applying assumptions about average daily visitor spending to the daily census for Japanese/non-Japanese and west-bound/eastbound visitors. The results are multiplied by 365 for an annual expenditures estimate. It is assumed that real (i.e., inflation adjusted) average daily spending for the four market segments will remain constant at current levels for the projection period. Based on 1994 expenditure surveys by the HVCB, average daily spending, in constant 1987 dollars, is assumed to remain \$263 for Japanese visitors and \$113 for non-Japanese visitors over the projection period. Real average visitor spending by Japanese visitors on a daily basis appears to have fallen in real dollar terms since 1986. However, part of the decline in spending reflected the distribution of trip expenditures over a somewhat longer length of stay, which increased from about 4 days in 1986 to the current 6 days. Real expenditures per trip by Japanese visitors have generally increased since 1986. Also, the current spending level reflects a cyclical low point in the Japanese economy, suggesting that spending is more likely to increase than decrease in the future.

Average daily visitor spending for the broader, non-Japanese visitor segment was roughly the same in 1986 and 1994, although it increased to a high of about \$132 in 1991 before declining. Again, when length of stay is taken into account, expenditures have averaged roughly \$1,000 per visitor per trip in real terms since 1986, with no clear trend up or down. Japanese and non-Japanese visitors tend to dominate the eastbound and westbound directions, respectively. Thus, the observation about relatively constant trip expenditures is also applicable to the direction of travel segments. Consequently, the most recent eastbound and westbound per-day expenditures are also held constant for the projection period.

The expected demand for occupied visitor rooms in the state over the projection period was projected as a function of the expected daily visitor census. The ratio between the average daily visitor census and the number of occupied visitor units increased from 2.0 to 3.0 between 1970 and 1995. In part, this was due to a higher proportion of visitors using condominium units which accommodate more persons per unit. The ratio is also impacted by the projected length of stay, the proportion of visitors not requiring commercial accommodations, and party size. The 2020 projections anticipate that the ratio between average daily visitor census and accommodation units will continue to increase gradually, from 3.0 in 1995 to 3.3 in the year 2010 where it is expected to stabilize.

The projection for total occupied hotel rooms at the state level serves as a control total for occupied visitor rooms at the county level. The projections for total visitor rooms at the state level—occupied and unoccupied—is the sum of the county-level projections for this measure. A summation of the county rooms was used in this case because the base historical data on occupancy rates by county is sufficiently rich to support independent projections at the county level for unoccupied rooms. The statewide occupancy rate, therefore, depends on the individual county occupancy rates. The method

for allocating occupied rooms and determining the total visitor room count at the county level is discussed below.

Figure 4-2 shows the remaining steps in the allocation process, resulting in projections for the visitor census and occupied visitor accommodations by county, and statewide projections for total visitor rooms. The statewide visitor projections were allocated to the county level in order to illustrate the potential impacts of the overall state projection on specific geographical areas. Data are insufficient to permit allocation of visitor projections below the county level.

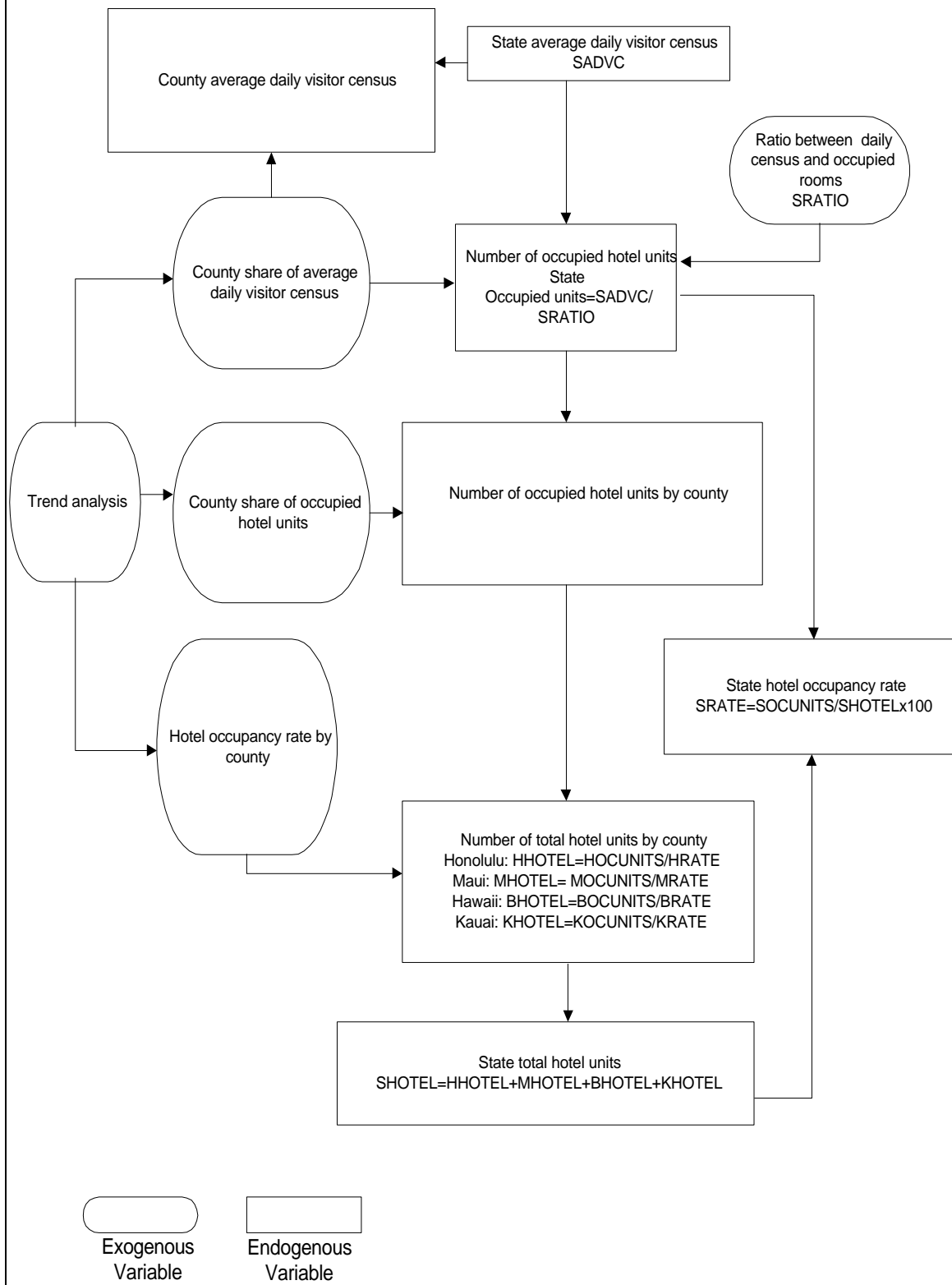
The first step in the allocation process is to distribute a share of the projected statewide average daily visitor census to each county. The share for each county is developed through historical trend analyses, similar to that used to estimate shares for the market segments discussed earlier. The shares of the visitor census absorbed by Kauai and Hawaii counties have been on the increase in recent years, while the Maui County share appears to have been stabilizing. The Oahu share has been declining over time, reflecting the gain in share by the Neighbor Island counties. Projections for the average daily census by county and the percent share of the state visitor census by county are shown in Table C-1 of Appendix C.

Each county is also allocated a share of the statewide count of occupied rooms. At the state level, the number of occupied hotel rooms is a function of the average daily visitor census. However, the measure of the overall average daily visitor census at the county level has existed for only a few years and the relationships are not as clear as for the state as a whole. On the other hand, the historical data base for occupied hotel rooms by county is quite long and the trend is easier to evaluate. Thus, occupied rooms are allocated on the basis of the historical trend in each county's share of statewide occupied visitor units. Like the visitor census, Hawaii and Kauai counties show an increasing trend and Oahu a decreasing trend, while the Maui County share is expected to be stable.

Projections for total visitor rooms by county—occupied and unoccupied—were derived by dividing the projection of occupied units by the expected long-run occupancy rates. As with many of the relationship variables, occupancy rate assumptions are developed through an analysis of past and current trends. It was projected that the average long-range occupancy rate for visitor rooms will approach 85 percent for Oahu, 80 percent for Maui, 75 percent for Kauai County, and 70 percent for Hawaii County. These rates are higher than those experienced over the past 25 years and reflect an expectation of less “overbuilding” of visitor accommodations in the future.

Finally, the sum of total visitor rooms by county equals total rooms of the state. The statewide occupancy rate is implied from the ratio of occupied rooms projected at the state level to total rooms projected for the counties.

Figure 4-3. Calculation of Daily Visitor Census and Hotel/Condo Units by County



5. DEMOGRAPHIC DATA AND ASSUMPTIONS

POPULATION DATA

The measure of total resident population used in the DBEDT 2020 series projections was developed by the U.S. Bureau of the Census and released in December 1996. The age-gender distribution and military status of the resident population in 1995 are presented in Table J-1 of Appendix J.

Data series for military personnel through 1995 and military dependents through 1994 were based on Census Bureau estimates. Census Bureau data for the number of military dependents in 1995 were unavailable. The number of military personnel was held constant over the projection period at its 1995 level of 50,700. The number of military dependents for 1995 was estimated as the average of 1985 to 1994 data and the result was held constant over the projection period. The age and gender distribution for military personnel and military dependents in 1990 was applied to 1995 data, and the distribution also held constant over the projection period.

The age-gender specific projection for the other civilian resident population was based on the cohort-survival method, and adjusted for net migration by age and gender. An age- and gender-specific distribution for net migration is not directly available, but was estimated by subtracting data for the natural increase in the population by detailed age-gender cohorts from similarly detailed census estimates of the change in resident population for the years 1981 to 1992. The difference between the change in population due to natural increase and the total change in population for any particular age-gender cohort represents net migration within that cohort. Together, these net migration cohorts represent the age-gender distribution of total net migration.

LIFE TABLES AND SURVIVAL RATES

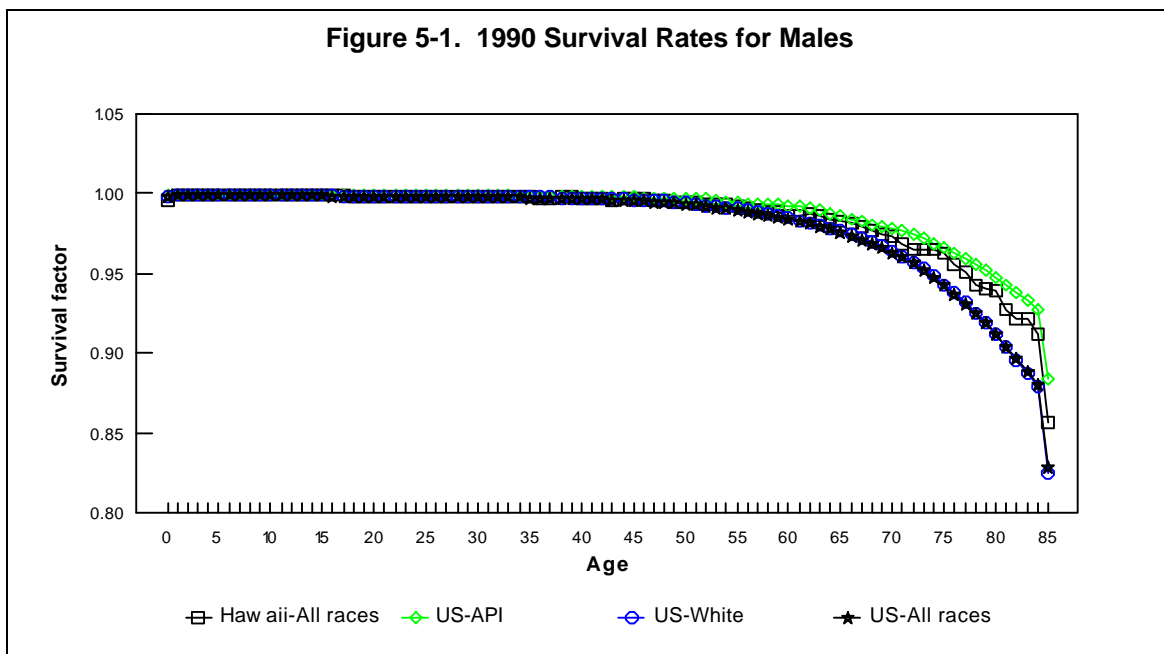
The cohort survival method is based on age-gender survival rates. A set of "life tables" containing Hawaii-specific, age-gender survival rates for non-military civilian males and females was produced using the 1990 Census of Population Modified Age/Race Sex (MARS) tabulations released in September 1994 and the average annual number of resident births and deaths over the three-year period 1989–1991 from the Hawaii State Department of Health. These tables were solely for the use of the long-range population projections and are unofficial. The life tables are presented in Tables J-2 and J-3 in Appendix J. Explanations of the life table components may be found in the National Center for Health Statistics' publication of United States life tables for 1989.¹

¹ U.S. Department of Health and Human Services, National Center for Health Statistics, *Vital Statistics of the United States, 1989, Life Tables*, Vol. II, Section 6, December 1992.

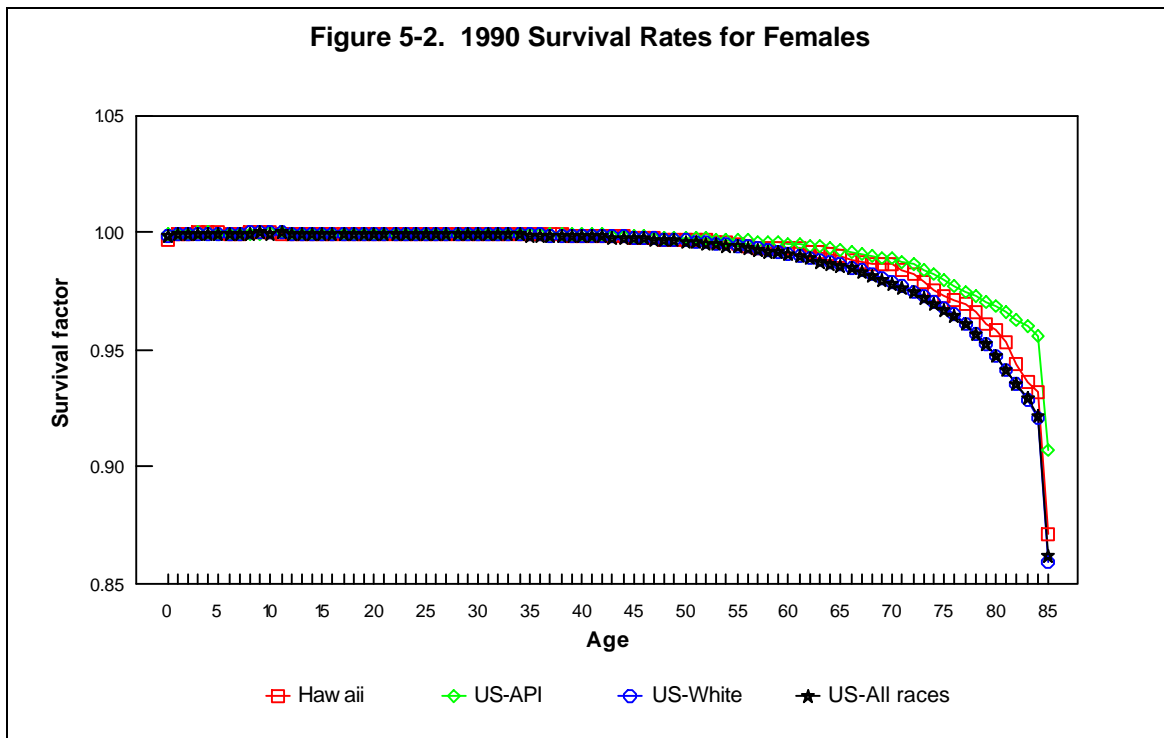
Survival rates were computed from the stationary population in the indicated age interval (L_x) and the next age interval (L_{x+1}), where L_x is the number of persons in the stationary population at x years of age, and L_{x+1} is the number of persons in the stationary population at $x+1$ years of age. A stationary population in a life table assumes 100,000 births each year which are subject to the proportion dying in each age interval (q_x) throughout the lives of this birth group. If there were no migration and if the births were evenly distributed over the year, the survivors of these births would make up the stationary population. Thus, survival rates (L_{x+1}/L_x) are the proportions of person in the indicated age interval of the stationary population that move from the indicated age interval (L_x) to the next age interval (L_{x+1}). The 1990 Hawaii survival rates by age and sex are provided in Table J-4 in Appendix J.

PROJECTED SURVIVAL RATES

Figures 5-1 and 5-2 compare the survival rates in Hawaii and the U.S. for both males and females from age 0 to 85. According to the Bureau of the Census population projections, survival rates are expected to improve over time, especially for males. Hawaii survival rates for the total population of age up to 50 years, and for Caucasians, Asian, and Pacific Islanders of age up to 50 years, were similar to national averages for these groups.



Note: The values for US-White and US-All Races are nearly identical, causing the lines to appear as one in the chart.



Note: The values for US-White and US-All Races are nearly identical, causing the lines to appear as one in the chart.

As shown in the figures, the survival rates for Hawaii start diverging from those of the U.S. after age 50. Hawaii's overall survival rate is lower than the U.S. rate for Asian-Pacific Islanders, but higher than U.S. rates for Caucasians and the U.S. average. Since Hawaii has a relatively large proportion of Asian and Pacific Islanders and survival rates are closer to those of Asian and Pacific Islanders as shown in the figures, Hawaii survival rates for the civilian resident population by single years of age from birth to 85 years and over were projected to 2020 by applying the percentage change of the middle-series survival rates of the U.S. Asian and Pacific Islander population from the 1993 U.S. Bureau of the Census' population projections.² These U.S. Asian and Pacific Islander survival rates that are used in the national projections were computed from components of the projected life tables obtained from the Bureau of the Census.

FERTILITY RATES

The fertility rate refers to the number of births among females of childbearing age. The fertility rates used in this projection were defined as the number of children born per 1,000 women in each of the 36 age groups from 14 through 49 in the other civilian

² U.S. Bureau of the Census, Current Population Reports, P25-1104, *Population Projections of the United States, by Age, Sex, Race, and Hispanic Origin: 1993 to 2050*, U.S. Government Printing Office, Washington, D.C., Nov. 1993; and special tabulations and records from the Bureau of Census.

population—that is, women who are neither military dependents nor in the armed forces. Births to these women by each year of age were obtained from tabulations of the vital records of the Hawaii State Department of Health for the three calendar years of 1989–1991. The birth data were averaged over the three years to smooth variations in births from year to year for women within a single age group.

The base population of other civilian women by individual age group from 14 through 49 years was constructed from the April 1, 1990 Census of Population revised (Sept. 1994) Modified Age/Race Sex (MARS) tabulations of total resident population. The revised MARS population series differ from the published Census data in the distribution of single-year, age data, especially in the lower age categories. However, the male and female totals are the same as the published data. The Census Bureau used the MARS data as the starting point for its post-census state population estimates and for its series of state population projections.

For these reasons, the revised MARS population data, rather than the published data, were chosen as the base from which birth rates and other basic series, such as the life tables, were derived. Data for female military dependents and females in the armed forces for ages 14 through 49 were removed from the revised MARS population data. The female military dependent and female armed forces components were tabulated from the U.S. Bureau of the Census Public Use Sample (PUMS) computer files from the April 1, 1990 Census of Population for Hawaii.

Births by age of mother were not available for 1995. Therefore, a measured base fertility rate by age group for the beginning year of the projections was not directly available. However, an overall fertility rate for 1995 was available based on data for the number of women by years of age in 1995 and the total number of births for that year. An estimate of 1995 fertility by age was constructed by allowing the entire structure of the age-specific 1990 fertility rates to increase proportionately in order to equal the overall 1995 fertility rate.

In mathematical form, the adjustment procedure can be expressed as follows:

(1) Selecting a value for BFACTOR until

$$\text{BIRTHS}_{95} = \sum_{i=14}^{49} \text{FPOP}_{95,i} \times \text{BIRTHRT}_{90,i} \times \text{BFACTOR}$$

then,

$$\text{BIRTHRT}_{95,i} = \text{BIRTHRT}_{90,i} \times \text{BFACTOR}$$

where:

BFACTOR = Birth rate increasing factor

BIRTHS₉₅ = Total non-military civilian births in 1995

FPOP_{95,i} = Number of females at age *i* in 1995, *i* = 14 to 49

$BIRTHRT_{90,i}$ = 1990 birth rate of females at age i

$BIRTHRT_{95,i}$ = 1995 birth rate of females at age i

The resulting fertility rates were held constant at the estimated 1995 rates over the projection period. Table J-5 of Appendix J provides both 1990 and estimated 1995 fertility rates.

APPENDIX A

STATE ECONOMIC AND POPULATION

PROJECTIONS

Table A-1. Hawaii State Gross State Product (millions of 1987 dollars)

	1995	2000	2005	2010	2015	2020
Gross state product	23,297.8	25,994.7	28,548.0	31,052.3	33,588.9	36,388.5
Final sales	38,070.4	42,519.6	46,831.5	51,183.5	55,820.8	60,954.7
Consumption	14,623.9	16,384.7	17,944.6	19,598.1	21,468.2	23,539.6
Investment in structures	1,493.5	1,425.3	1,448.4	1,430.3	1,458.2	1,483.6
Other investment	1,397.9	1,558.0	1,733.1	1,931.2	2,160.7	2,416.9
State and local government expenditures	3,075.3	3,406.1	3,694.1	4,005.7	4,362.1	4,758.5
State and local government construction	815.4	815.4	815.4	815.4	815.4	815.4
Federal defense expenditures	3,095.1	3,241.6	3,348.6	3,484.1	3,596.8	3,744.9
Federal defense construction	120.0	120.0	120.0	120.0	120.0	120.0
Federal nondefense expenditures	629.0	693.4	755.6	823.4	901.1	987.5
Visitor expenditures	8,347.1	9,998.4	11,578.2	13,085.0	14,490.6	16,047.0
Exports	4,473.2	4,876.7	5,393.5	5,910.3	6,447.7	7,041.3
Imports	14,772.6	16,524.9	18,283.5	20,131.2	22,231.9	24,566.2

Hawaii State Gross State Product (average annual percent growth rate)

	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Gross state product					
Final sales	2.2	1.9	1.7	1.6	1.6
Consumption	2.2	2.0	1.8	1.7	1.8
Investment in structures	2.3	1.8	1.8	1.8	1.9
Other investment	-0.9	0.3	-0.3	0.4	0.3
State and local government expenditures	2.2	2.2	2.2	2.3	2.3
State and local government construction	2.1	1.6	1.6	1.7	1.8
Federal defense expenditures	0.0	0.0	0.0	0.0	0.0
Federal defense construction	0.9	0.7	0.7	0.8	0.8
Federal nondefense expenditures	0.0	0.0	0.0	0.0	0.0
Visitor expenditures	2.0	1.7	1.7	1.8	1.8
Exports	3.7	3.0	2.5	2.1	2.1
Imports	1.7	2.0	1.8	1.8	1.8
	2.3	2.0	1.9	2.0	2.0

Table A-2. Hawaii State Output (millions of 1987 dollars)

	1995	2000	2005	2010	2015	2020
Total output	32,989.6	37,291.9	41,550.2	45,766.6	50,166.8	54,994.8
Agriculture ¹	334.7	341.9	386.6	431.6	478.5	530.4
Manufacturing	3,180.9	3,535.9	3,958.0	4,377.4	4,814.6	5,298.5
Construction & mining	3,344.8	3,579.7	3,902.2	4,183.2	4,513.3	4,848.6
Transportation & utilities	3,987.6	4,645.6	5,268.3	5,880.5	6,492.4	7,170.1
Eating and drinking places	1,927.9	2,267.6	2,586.1	2,898.8	3,208.6	3,551.6
Trade (except eating)	4,377.8	4,960.7	5,508.8	6,061.1	6,642.8	7,286.9
Finance, insurance, and real estate	5,767.9	6,478.7	7,123.9	7,795.3	8,535.2	9,354.6
Hotels	2,850.2	3,315.6	3,760.1	4,185.2	4,584.3	5,026.2
Services (except hotels)	7,084.2	8,014.0	8,887.2	9,767.7	10,693.7	11,705.0
Government enterprises	133.6	152.2	169.0	185.8	203.4	222.9

¹ Includes forestry and fishery.

Hawaii State Output (average annual percent growth rate)

	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Total output	2.5	2.2	2.0	1.9	1.9
Agriculture	0.4	2.5	2.2	2.1	2.1
Manufacturing	2.1	2.3	2.0	1.9	1.9
Construction	1.4	1.7	1.4	1.5	1.4
Transportation & utilities	3.1	2.5	2.2	2.0	2.0
Eating and drinking places	3.3	2.7	2.3	2.1	2.1
Trade (except eating)	2.5	2.1	1.9	1.8	1.9
Finance, insurance, and real estate	2.4	1.9	1.8	1.8	1.9
Hotels	3.1	2.5	2.2	1.8	1.9
Services (except hotels)	2.5	2.1	1.9	1.8	1.8
Government enterprises	2.6	2.1	1.9	1.8	1.8

Table A-3. Hawaii State Employment (thousands)

	1995	2000	2005	2010	2015	2020
Civilian labor force	579.8	613.2	650.8	687.3	721.9	757.4
Civilian persons employed	545.8	585.2	619.5	651.9	685.7	721.5
Civilian unemployment rate (%)	34.0	28.0	31.3	35.3	36.2	35.9
Civilian unemployment rate (abs. Change)	5.9	4.6	4.8	5.1	5.0	4.7
Labor force participation rate (%)	67.6	67.7	67.5	67.1	67.1	67.4
Working age population (16+)	857.3	906.3	963.4	1024.2	1075.7	1124.6
Total civilian jobs	576.5	619.4	656.8	692.3	728.8	767.3
Self-employed	36.2	39.1	41.3	43.2	45.2	47.2
Wage and salary	540.3	580.3	615.5	649.1	683.6	720.1
Agriculture	7.5	8.0	8.0	8.0	8.0	8.0
Manufacturing	17.0	16.9	17.4	18.0	18.7	19.6
Construction & mining	26.4	26.9	27.9	28.4	29.2	29.8
Transportation & utilities	40.7	45.3	49.1	52.3	54.8	57.6
Eating and drinking places	46.9	53.5	59.3	64.5	69.3	74.4
Trade (except eating)	88.8	97.6	105.1	112.3	119.4	127.1
Finance, insurance, and real estate	37.1	40.2	42.7	45.2	47.7	50.5
Hotels	37.9	42.2	45.7	48.7	51.0	53.4
Services (except hotels)	126.9	138.7	148.5	157.6	166.6	176.0
Government enterprises	2.8	3.1	3.4	3.6	3.9	4.1
State and local government	80.4	80.4	80.4	82.0	85.8	89.6
Federal government	27.9	27.5	28.0	28.5	29.2	30.0

Hawaii State Employment (average annual percent growth rate)

	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Civilian labor force	1.1	1.2	1.1	1.0	1.0
Civilian persons employed	1.4	1.1	1.0	1.0	1.0
Civilian unemployment rate (absolute change)	-3.8	2.3	2.4	0.5	-0.2
Civilian unemployment rate (abs. Change)	-1.3	0.2	0.3	-0.1	-0.3
Labor force participation rate (abs. Change)	0.1	-0.2	-0.4	0.0	0.3
Working age population (16+)	1.1	1.2	1.2	1.0	0.9
Total civilian jobs	1.4	1.2	1.1	1.0	1.0
Self-employed	1.6	1.1	0.9	0.9	0.9
Wage and salary	1.4	1.2	1.1	1.0	1.0
Agriculture	1.3	0.0	0.0	0.0	0.0
Manufacturing	-0.1	0.6	0.7	0.8	0.9
Construction & mining	0.4	0.7	0.4	0.6	0.4
Transportation & utilities	2.2	1.6	1.3	0.9	1.0
Eating and drinking places	2.7	2.1	1.7	1.4	1.4
Trade (except eating)	1.9	1.5	1.3	1.2	1.3
Finance, insurance, and real estate	1.6	1.2	1.1	1.1	1.1
Hotels	2.2	1.6	1.3	0.9	0.9
Services (except hotels)	1.8	1.4	1.2	1.1	1.1
Government enterprises	2.1	1.9	1.1	1.6	1.0
State and local government	0.0	0.0	0.4	0.9	0.9
Federal government	-0.3	0.4	0.4	0.5	0.5

Table A-4. Hawaii State Personal Income (millions of 1987 dollars)

	1995	2000	2005	2010	2015	2020
Disposable personal income	18,501.9	20,471.3	22,316.9	24,330.5	26,634.4	29,196.4
Personal income taxes	2,753.7	3,200.4	3,585.2	3,975.2	4,417.4	4,908.7
Personal income	21,255.6	23,671.7	25,902.1	28,305.7	31,051.8	34,105.1
Per capita personal income (\$87)	18,025.0	19,113.0	19,862.0	20,709.0	21,705.0	22,825.0
Non-labor income	5,867.3	6,556.1	7,201.5	7,988.7	8,982.4	10,126.9
Transfer payments	3,475.1	3,865.0	4,217.0	4,724.5	5,432.5	6,294.2
Dividends, interest and rent	3,397.1	3,797.8	4,197.7	4,579.4	4,967.3	5,354.0
Contribution to social insurance	1,004.9	1,106.7	1,213.2	1,315.2	1,417.4	1,521.3
Labor income	15,388.3	17,115.6	18,700.6	20,317.0	22,069.4	23,978.2
Agriculture	129.5	136.9	136.9	136.9	136.9	136.9
Manufacturing	580.9	643.4	718.4	792.8	870.3	955.9
Construction & mining	1,237.5	1,325.1	1,444.5	1,548.5	1,670.7	1,794.8
Transportation & utilities	1,249.4	1,466.7	1,673.0	1,875.4	2,076.9	2,299.9
Eating and drinking places	1,352.7	1,531.9	1,699.5	1,888.0	2,044.3	2,239.5
Trade (except eating)	1,164.6	1,346.1	1,517.1	1,687.4	1,862.2	2,055.6
Finance, insurance, and real estate	1,158.6	1,299.9	1,429.4	1,564.1	1,712.5	1,876.9
Hotels	902.2	1,049.3	1,190.0	1,324.6	1,450.9	1,590.8
Services (except hotels)	3,747.8	4,252.9	4,727.8	5,208.0	5,716.3	6,269.5
Government enterprises	116.4	132.7	147.4	162.1	177.4	194.4
State and local government	1,879.8	2,019.5	2,070.5	2,165.2	2,323.5	2,488.1
Federal government	1,868.9	1,911.2	1,946.1	1,984.0	2,027.5	2,075.9

Hawaii State Personal Income (average annual percent growth rate)

	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Disposable personal income	2.0	1.7	1.7	1.8	1.9
Personal income taxes	3.1	2.3	2.1	2.1	2.1
Personal income	2.2	1.8	1.8	1.9	1.9
Per capita personal income	1.2	0.8	0.8	0.9	1.0
Non-labor income	2.2	1.9	2.1	2.4	2.4
Transfer payments	2.1	1.8	2.3	2.8	3.0
Dividends, interest and rent	2.3	2.0	1.8	1.6	1.5
Contribution to social insurance	1.9	1.9	1.6	1.5	1.4
Labor income	2.2	1.8	1.7	1.7	1.7
Agriculture	1.1	0.0	0.0	0.0	0.0
Manufacturing	2.1	2.2	2.0	1.9	1.9
Construction & mining	1.4	1.7	1.4	1.5	1.4
Transportation & utilities	3.3	2.7	2.3	2.1	2.1
Eating and drinking places	2.5	2.1	1.9	1.8	1.8
Trade (except eating)	2.9	2.4	2.2	2.0	2.0
Finance, insurance, and real estate	2.3	1.9	1.8	1.8	1.9
Hotels	3.1	2.5	2.2	1.8	1.9
Services (except hotels)	2.6	2.1	2.0	1.9	1.9
Government enterprises	2.7	2.1	1.9	1.8	1.8
State and local government	1.4	0.5	0.9	1.4	1.4
Federal government	0.4	0.4	0.4	0.4	0.5

Table A-5. Hawaii State Population (thousands)

	1995	2000	2005	2010	2015	2020
Resident population	1,179.2	1,238.5	1,304.0	1,366.8	1,430.5	1,494.1
Military personnel	50.7	50.7	50.7	50.7	50.7	50.7
Civilian population ¹	1,128.5	1,187.8	1,253.3	1,316.0	1,379.8	1,443.4
Population change	14.8	11.9	13.1	12.5	12.8	12.7
School age children (5 to 11 years)	118.1	127.8	124.3	125.0	131.4	139.3
School age children (12 to 13 years)	32.9	31.6	36.9	34.8	35.5	37.4
School age children (14 to 17 years)	62.4	63.4	68.6	70.4	68.1	70.7
Population 65 years and over	149.7	165.0	178.7	200.4	234.1	275.1
Avg. annual civilian births ²	16.0	15.3	15.7	16.7	17.8	18.5
Avg. annual civilian deaths ²	7.0	7.8	9.1	10.2	11.3	12.1
Avg. annual net civilian migration ²	5.9	4.5	6.5	6.2	6.3	6.4
Total resident housing units	409.2	428.5	454.4	479.6	505.5	531.7
Federal government units	21.1	21.1	21.1	21.1	21.1	21.1
State & county government units	9.4	9.6	10.0	10.3	10.6	11.0

¹ Including military dependents.

² Excluding military dependents, average of preceding 5 years.

Hawaii State Population (average annual percent growth rate)

	1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Population	1.0	1.0	0.9	0.9	0.9
Military personnel	0.0	0.0	0.0	0.0	0.0
Non-military population	1.0	1.1	1.0	1.0	0.9
Population change	-4.3	1.9	-0.9	0.5	-0.2
School age children (5 to 11 years)	1.6	-0.6	0.1	1.0	1.2
School age children (12 to 13 years)	-0.8	3.1	-1.2	0.4	1.0
School age children (14 to 17 years)	0.3	1.6	0.5	-0.7	0.8
Population 65 years and over	2.0	1.6	2.3	3.2	3.3
Avg. Annual civilian births	-0.9	0.5	1.2	1.3	0.8
Avg. Annual civilian deaths	2.2	3.1	2.3	2.1	1.4
Avg. Annual net civilian migration	-5.3	7.6	-0.9	0.3	0.3
Total resident housing units	0.9	1.2	1.1	1.1	1.0
Federal government units	0.0	0.0	0.0	0.0	0.0
State & county government units	0.4	0.8	0.6	0.6	0.7

APPENDIX B
COUNTY ECONOMIC AND POPULATION
PROJECTIONS

Table B-1. City & County of Honolulu: Population, Personal Income, and Employment

	1995	2000	2005	2010	2015	2020
Population (thous.)	870.9	904.0	944.0	980.0	1,016.0	1,050.6
Personal income (mils. \$1987)	16,622.0	18,363.0	19,982.9	21,701.5	23,670.0	25,841.0
Per capita income (\$1987)	19,086.0	20,313.0	21,167.0	22,143.0	23,296.0	24,596.0
Total civilian jobs (thous.)	431.9	459.6	482.4	502.9	524.6	546.8
Self-employed workers	21.4	23.0	24.1	24.8	25.6	26.3
Wage and salary employment	410.5	436.6	458.3	478.1	499.0	520.5
Agriculture	2.0	2.1	2.1	2.1	2.1	2.1
Manufacturing	12.9	13.0	13.3	13.7	14.2	15.0
Construction & mining	20.4	20.4	21.0	21.1	21.4	21.5
Transportation and utilities	33.2	37.1	40.0	42.4	44.4	46.3
Eating and drinking places	35.2	39.3	42.9	45.8	48.3	50.8
Trade (except eating)	66.2	72.5	77.2	81.4	85.7	90.3
Finance, insur., and real est.	30.5	32.6	34.3	36.0	37.9	39.9
Hotels	18.2	19.6	20.6	21.2	21.5	21.6
Services (except hotels)	102.3	110.9	117.6	123.7	129.8	136.1
State and local government	60.6	60.2	59.8	60.5	62.7	65.0
Federal government	29.0	28.9	29.5	30.2	31.0	31.9
Average annual growth rate (%)		1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Population (thous.)		0.7	0.9	0.8	0.7	0.7
Personal income (mils. \$87)		2.0	1.7	1.7	1.8	1.8
Per capita income (\$87)		1.3	0.8	0.9	1.0	1.1
Total civilian jobs (thous.)		1.2	1.0	0.8	0.8	0.8
Self-employed workers		1.5	0.9	0.6	0.6	0.5
Wage and salary employment		1.2	1.0	0.8	0.9	0.8
Agriculture		0.5	0.0	0.0	0.0	0.0
Manufacturing		0.2	0.5	0.6	0.7	1.1
Construction & mining		0.0	0.6	0.1	0.3	0.1
Transportation and utilities		2.2	1.5	1.2	0.9	0.8
Eating and drinking places		2.2	1.8	1.3	1.1	1.0
Trade (except eating)		1.8	1.3	1.1	1.0	1.1
Finance, insur., and real est.		1.3	1.0	1.0	1.0	1.0
Hotels		1.5	1.0	0.6	0.3	0.1
Services (except hotels)		1.6	1.2	1.0	1.0	1.0
State and local government		-0.1	-0.1	0.2	0.7	0.7
Federal government		-0.1	0.4	0.5	0.5	0.6

Table B-2. Maui County: Population, Personal Income, and Employment

	1995	2000	2005	2010	2015	2020
Population (thous.)	115.2	124.0	132.8	140.9	148.0	155.4
Personal income (mils. \$87)	1,955.5	2,240.8	2,500.8	2,774.2	3,066.8	3,397.9
Per capita income (\$87)	16,981.0	18,070.0	18,828.0	19,695.0	20,717.0	21,871.0
Total civilian jobs (thous.)	61.8	67.3	72.7	77.5	81.8	87.1
Self-employed workers	5.8	5.9	6.2	6.4	6.7	7.1
Wage and salary employment	56.0	61.4	66.5	71.1	75.1	80.0
Agriculture	1.9	2.0	2.0	2.0	2.0	2.0
Manufacturing	1.8	1.8	1.8	1.9	1.9	2.0
Construction & mining	2.0	2.1	2.2	2.3	2.3	2.4
Transportation and utilities	3.4	3.7	4.1	4.4	4.6	4.8
Eating and drinking places	5.7	6.7	7.5	8.3	8.9	9.6
Trade (except eating)	9.4	10.3	11.4	12.4	13.4	14.5
Finance, insur., and real est.	3.0	3.5	3.9	4.2	4.5	4.8
Hotels	11.0	12.1	13.2	14.0	14.5	15.2
Services (except hotels)	10.4	11.6	12.6	13.5	14.3	15.3
State and local government	7.0	7.1	7.3	7.6	8.2	8.8
Federal government	0.5	0.5	0.5	0.5	0.5	0.6
Average annual growth rate (%)		1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Population (thous.)		1.5	1.4	1.2	1.0	1.0
Personal income (mils. \$87)		2.8	2.2	2.1	2.0	2.1
Per capita income (\$87)		1.3	0.8	0.9	1.0	1.1
Total civilian jobs (thous.)		1.7	1.6	1.3	1.1	1.3
Self-employed workers		0.3	1.0	0.6	0.9	1.2
Wage and salary employment		1.8	1.6	1.3	1.1	1.3
Agriculture		0.5	0.0	0.0	0.0	0.0
Manufacturing		0.0	0.0	1.1	0.0	1.0
Construction & mining		1.0	0.9	0.9	0.0	0.9
Transportation and utilities		1.7	2.1	1.4	0.9	0.9
Eating and drinking places		3.5	2.3	2.0	1.4	1.5
Trade (except eating)		2.0	2.1	1.7	1.6	1.6
Finance, insur., and real est.		3.1	2.2	1.5	1.4	1.3
Hotels		1.9	1.8	1.2	0.7	0.9
Services (except hotels)		2.2	1.7	1.4	1.2	1.4
State and local government		0.3	0.6	0.8	1.5	1.4
Federal government		0.0	0.0	0.0	0.0	3.7

Table B-3. Hawaii County: Population, Personal Income, and Employment

	1995	2000	2005	2010	2015	2020
Population (thous.)	137.2	149.6	160.6	173.9	189.1	205.4
Personal income (mils. \$87)	1,806.7	2,054.0	2,260.3	2,515.2	2,824.7	3,176.2
Per capita income (\$87)	13,171.0	13,729.0	14,071.0	14,466.0	14,934.0	15,465.0
Total civilian jobs (thous.)	56.8	62.4	68.0	74.0	81.1	88.9
Self-employed workers	7.0	7.8	8.4	9.1	9.8	10.6
Wage and salary employment	49.8	54.6	59.6	64.9	71.3	78.3
Agriculture	2.6	3.0	3.0	3.0	3.0	3.0
Manufacturing	1.8	1.7	1.8	1.9	2.0	2.1
Construction & mining	2.6	2.9	3.2	3.5	3.9	4.4
Transportation and utilities	2.6	2.8	3.1	3.5	3.8	4.3
Eating and drinking places	3.7	4.3	4.9	5.7	6.7	7.9
Trade (except eating)	9.1	10.1	11.3	12.5	13.8	15.2
Finance, insur., and real est.	2.3	2.5	2.7	2.8	3.0	3.2
Hotels	5.6	6.3	7.1	8.0	9.1	10.2
Services (except hotels)	9.5	10.7	11.8	12.8	13.9	15.1
State and local government	9.2	9.4	9.7	10.2	11.0	11.8
Federal government	0.9	0.9	1.0	1.0	1.1	1.1
Average annual growth rate (%)		1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Population (thous.)		1.7	1.4	1.6	1.7	1.7
Personal income (mils. \$87)		2.6	1.9	2.2	2.3	2.4
Per capita income (\$87)		0.8	0.5	0.6	0.6	0.7
Total civilian jobs (thous.)		1.9	1.7	1.7	1.8	1.9
Self-employed workers		2.2	1.5	1.6	1.5	1.6
Wage and salary employment		1.8	1.8	1.7	1.9	1.9
Agriculture		2.9	0.0	0.0	0.0	0.0
Manufacturing		-1.1	1.1	1.1	1.0	1.0
Construction & mining		2.2	2.0	1.8	2.2	2.4
Transportation and utilities		1.5	2.1	2.5	1.7	2.5
Eating and drinking places		3.2	2.6	3.1	3.3	3.3
Trade (except eating)		2.2	2.3	2.0	2.0	2.0
Finance, insur., and real est.		1.7	1.6	0.7	1.4	1.3
Hotels		2.4	2.4	2.4	2.6	2.3
Services (except hotels)		2.4	2.0	1.6	1.7	1.7
State and local government		0.4	0.6	1.0	1.5	1.4
Federal government		0.0	2.1	0.0	1.9	0.0

Table B-4. Kauai County: Population, Personal Income, and Employment

	1995	2000	2005	2010	2015	2020
Population (thous.)	56.0	60.9	66.6	72.0	77.3	82.8
Personal income (mils. \$87)	871.5	1014.1	1158.0	1314.8	1490.1	1689.9
Per capita income (\$87)	15568.0	16646.0	17396.0	18253.0	19264.0	20404.0
Total civilian jobs (thous.)	26.8	30.3	34.1	37.9	41.1	45.0
Self-employed workers	2.0	2.3	2.6	2.9	3.1	3.3
Wage and salary employment	24.8	28.0	31.5	35.0	38.0	41.7
Agriculture	1.0	1.0	1.0	1.0	1.0	1.0
Manufacturing	0.5	0.5	0.5	0.5	0.5	0.6
Construction & mining	1.5	1.5	1.5	1.5	1.5	1.5
Transportation and utilities	1.5	1.7	1.9	2.0	2.1	2.2
Eating and drinking places	2.5	3.2	4.0	4.8	5.3	6.1
Trade (except eating)	4.4	4.7	5.3	5.9	6.5	7.1
Finance, insur., and real est.	1.4	1.7	1.9	2.1	2.4	2.7
Hotels	3.2	4.2	4.7	5.4	5.9	6.4
Services (except hotels)	4.7	5.5	6.6	7.6	8.5	9.5
State and local government	3.7	3.6	3.7	3.8	3.9	4.1
Federal government	0.4	0.4	0.4	0.4	0.4	0.5
Average annual growth rate (%)		1995-2000	2000-2005	2005-2010	2010-2015	2015-2020
Population (thous.)		1.7	1.8	1.6	1.4	1.4
Personal income (mils. \$87)		3.1	2.7	2.6	2.5	2.5
Per capita income (\$87)		1.3	0.9	1.0	1.1	1.2
Total civilian jobs (thous.)		2.5	2.4	2.1	1.6	1.8
Self-employed workers		2.8	2.5	2.2	1.3	1.3
Wage and salary employment		2.5	2.4	2.1	1.7	1.9
Agriculture		0.0	0.0	0.0	0.0	0.0
Manufacturing		0.0	0.0	0.0	0.0	3.7
Construction & mining		0.0	0.0	0.0	0.0	0.0
Transportation and utilities		2.5	2.2	1.0	1.0	0.9
Eating and drinking places		5.1	4.6	3.7	2.0	2.9
Trade (except eating)		1.4	2.4	2.2	2.0	1.8
Finance, insur., and real est.		4.0	2.2	2.0	2.7	2.4
Hotels		5.6	2.3	2.8	1.8	1.6
Services (except hotels)		3.2	3.7	2.9	2.3	2.2
State and local government		-0.5	0.5	0.5	0.5	1.0
Federal government		0.0	0.0	0.0	0.0	4.6

APPENDIX C

STATE AND COUNTY TOURISM PROJECTIONS

Table C-1. Projection of Visitor Variables, 1995–2020

Year	1995	2000	2005	2010	2015	2020
Visitor arrivals (1,000)						
Total	6,629.2	7,873.4	9,127.4	10,326.9	11,401.7	12,588.4
Japanese	1,998.9	2,519.5	3,012.1	3,511.1	3,990.6	4,531.8
Non-Japanese	4,630.3	5,353.9	6,115.4	6,815.7	7,411.1	8,056.6
Eastbound	2,696.1	3,306.8	4,016.1	4,750.4	5,358.8	6,042.4
Westbound	3,933.1	4,566.6	5,111.4	5,576.5	6,042.9	6,546.0
Visitor arrivals (average annual growth, %)¹						
Total		3.5	3.0	2.5	2.0	2.0
Japanese		4.7	3.6	3.1	2.6	2.6
Non-Japanese		2.9	2.7	2.2	1.7	1.7
Eastbound		4.2	4.0	3.4	2.4	2.4
Westbound		3.0	2.3	1.8	1.6	1.6
Average length of stay (days)						
Total	8.7	8.7	8.6	8.5	8.5	8.4
Japanese	6.0	6.0	6.0	6.0	6.0	6.0
Non-Japanese	9.9	9.9	9.9	9.8	9.8	9.8
Eastbound	6.0	6.0	6.0	6.0	6.0	6.0
Westbound	10.6	10.6	10.6	10.6	10.6	10.6
Average daily visitor census (1,000)						
State	158.4	187.4	214.9	240.5	264.1	290.1
Oahu	81.6	93.7	103.2	110.6	117.5	124.7
Maui	42.8	50.6	58.0	64.9	71.3	78.3
Kauai	15.8	20.6	25.8	31.3	35.7	40.6
Hawaii	18.2	22.5	27.9	33.7	39.6	46.4
Japanese	33.1	41.4	49.5	57.7	65.6	74.5
Non-Japanese	125.3	145.9	165.4	182.8	198.5	215.6
Eastbound	44.1	54.7	66.5	78.6	88.7	100.0
Westbound	114.3	132.6	148.4	161.9	175.5	190.1

Table C-1. Projection of Visitor Variables, 1995–2020 (continued)

Year	1995	2000	2005	2010	2015	2020
Average daily visitor census (average annual % growth rate)¹						
State		3.4	2.8	2.3	1.9	1.9
Oahu		2.8	1.9	1.4	1.2	1.2
Maui		3.4	2.8	2.3	1.9	1.9
Kauai		5.4	4.6	3.9	2.7	2.6
Hawaii		4.3	4.4	3.8	3.3	3.2
Japanese		4.6	3.6	3.1	2.6	2.6
Non-Japanese		3.1	2.5	2.0	1.7	1.7
Eastbound		4.4	4.0	3.4	2.4	2.4
Westbound		3.0	2.3	1.8	1.6	1.6
Percent share of average daily visitor census by county						
Oahu	51.5	50.0	48.0	46.0	44.5	43.0
Maui	27.0	27.0	27.0	27.0	27.0	27.0
Kauai	10.0	11.0	12.0	13.0	13.5	14.0
Hawaii	11.5	12.0	13.0	14.0	15.0	16.0
Visitor expenditures (millions of 1987 dollars)						
Total	8,347.1	9,998.4	11,578.2	13,085.0	14,490.6	16,047.0
Japanese	3,174.6	3,974.9	4,751.9	5,539.3	6,295.7	7,149.6
Non-Japanese	5,172.6	6,023.5	6,826.3	7,545.7	8,194.9	8,897.4
Eastbound	3,562.8	4,447.2	5,364.8	6,306.1	7,144.8	8,089.7
Westbound	4,784.4	5,551.2	6,213.4	6,778.8	7,345.8	7,957.3
Visitor expenditures(average annual % growth rate)¹						
Total		3.7	3.0	2.5	2.1	2.1
Japanese		4.6	3.6	3.1	2.6	2.6
Non-Japanese		3.1	2.5	2.0	1.7	1.7
Eastbound		4.5	3.8	3.3	2.5	2.5
Westbound		3.0	2.3	1.8	1.6	1.6

Table C-1. Projection of Visitor Variables, 1995–2020 (continued)

Year	1995	2000	2005	2010	2015	2020
Occupancy rate, hotel and other visitor rooms (percent)						
State	75.7	77.3	78.7	79.2	79.6	79.8
Oahu	81.6	82.0	82.0	82.0	83.0	83.0
Maui	75.6	77.0	78.0	79.0	80.0	80.0
Kauai	65.4	70.0	72.0	74.0	75.0	75.0
Hawaii	60.6	63.0	68.0	70.0	70.0	70.0
Number of visitor rooms						
State	69,764	78,546	86,208	92,853	101,121	111,142
Oahu	35,912	39,432	42,178	44,000	46,291	50,303
Maui	17,810	20,407	22,386	23,989	26,014	28,567
Kauai	6,459	8,634	9,794	11,327	12,807	14,064
Hawaii	9,584	10,073	11,851	13,537	16,009	18,208
Number of visitor rooms (average annual % growth rate)¹						
State		2.4	1.9	1.5	1.7	1.9
Oahu		1.9	1.4	0.8	1.0	1.7
Maui		2.8	1.9	1.4	1.6	1.9
Kauai		6.0	2.6	3.0	2.5	1.9
Hawaii		1.0	3.3	2.7	3.4	2.6
Number of occupied visitor rooms						
State	52,800	60,437	67,157	72,889	80,044	87,898
Oahu	29,304	32,334	34,586	36,080	38,421	41,752
Maui	13,464	15,714	17,461	18,951	20,811	22,854
Kauai	4,224	6,044	7,051	8,382	9,605	10,548
Hawaii	5,808	6,346	8,059	9,476	11,206	12,745
Number of occupied visitor rooms (average annual % growth rate)¹						
State		2.7	2.1	1.7	1.9	1.9
Oahu		2.0	1.4	0.8	1.3	1.7
Maui		3.1	2.1	1.7	1.9	1.9
Kauai		7.4	3.1	3.5	2.8	1.9
Hawaii		1.8	4.9	3.3	3.4	2.6

Table C-1. Projection of Visitor Variables, 1995–2020 (continued)

Year	1995	2000	2005	2010	2015	2020
Percent share of occupied visitor rooms						
Oahu	55.5	53.5	51.5	49.5	48.0	47.5
Maui	25.5	26.0	26.0	26.0	26.0	26.0
Kauai	8.0	10.0	10.5	11.5	12.0	12.0
Hawaii	11.0	10.5	12.0	13.0	14.0	14.5
Ratio between average daily census and occupied visitor rooms						
State	3.0	3.1	3.2	3.3	3.3	3.3

¹ Five-year average growth rate ending in the year indicated by the column head.

TABLE C-2. Actual and Forecasts of Japanese and Non-Japanese Visitors,

Year	Japanese			Non-Japanese			Total	
	Number	Percent of Total	Average Annual Growth (%)	Number	Percent of Total	Average Annual Growth (%)	Number	Average Annual Growth (%)
1970	131.5	7.5		1615.5	92.5		1747.0	
1975	400.0	14.1	24.9	2429.1	85.9	8.5	2829.1	10.1
1980	658.1	16.7	10.5	3276.4	83.3	6.2	3934.5	6.8
1985	855.0	17.5	5.4	4029.1	82.5	4.2	4884.1	4.4
1990	1439.7	20.7	11.0	5531.5	79.3	6.5	6971.2	7.4
1995	1998.9	30.2	6.8	4630.3	69.8	-3.5	6629.2	-1.0
2000	2519.5	32.0	4.7	5353.9	68.0	2.9	7873.4	3.5
2005	3012.1	33.0	3.6	6115.4	67.0	2.7	9127.4	3.0
2010	3511.1	34.0	3.1	6815.7	66.0	2.2	10326.9	2.5
2015	3990.6	35.0	2.6	7411.1	65.0	1.7	11401.7	2.0
2020	4531.8	36.0	2.6	8056.6	64.0	1.7	12588.4	2.0

Table C-3. Actual and Forecasts of Westbound and Eastbound Visitors, 1970–2020

Year	Eastbound			Westbound			Total	
	Number	Percent of Total	Average Annual Growth (%)	Number	Percent of Total	Average Annual Growth (%)	Number	Average Annual Growth (%)
1970	420.9	24.1		1326.1	75.9		1747.0	
1975	621.7	22.0	8.1	2207.4	78.0	10.7	2829.1	10.1
1980	888.4	22.6	7.4	3046.1	77.4	6.7	3934.5	6.8
1985	1175.5	24.1	5.8	3708.6	75.9	4.0	4884.1	4.4
1990	2251.5	32.3	13.9	4719.7	67.7	4.9	6971.2	7.4
1995	2696.1	40.7	3.7	3933.1	59.3	-3.6	6629.2	-1.0
2000	3306.8	42.0	4.2	4566.6	58.0	3.0	7873.4	3.5
2005	4016.1	44.0	4.0	5111.4	56.0	2.3	9127.4	3.0
2010	4750.4	46.0	3.4	5576.5	54.0	1.8	10326.9	2.5
2015	5358.8	47.0	2.4	6042.9	53.0	1.6	11401.7	2.0
2020	6042.4	48.0	2.4	6546.0	52.0	1.6	12588.4	2.0

**Table C-4. Per Capita Japanese and U.S.
Visitor Expenditures and the Yen/Dollar
Exchange Rate, 1986–1994**

Year	Per Capita Visitor Expenditures (1987 dollars)		Yen/U.S.\$
	Japanese	Non-Japanese	Exchange rate
1986	374.3	113.2	168.4
1987	376.2	116.1	144.6
1988	336.4	129.3	128.2
1989	288.9	121.5	138.1
1990	249.3	121.0	145.0
1991	285.4	132.4	134.6
1992	282.4	110.8	126.8
1993	262.0	108.8	111.1
1994	262.9	113.1	102.2

Table C-5. Visitor Arrivals and Average Length of Stay, 1980–1995

Year	Visitors Staying Overnight or Longer			Average Length of Stay (days)		
	Westbound	Eastbound	Total	Westbound	Eastbound	Total
1980	3,046,132	888,372	3,934,504	10.39	3.99	8.95
1981	2,974,791	959,832	3,934,623	10.49	4.00	8.90
1982	3,278,525	964,400	4,242,920	10.56	4.00	9.07
1983	3,396,115	971,990	4,368,105	10.47	4.00	9.03
1984	3,721,380	1,134,200	4,855,580	10.42	3.99	8.92
1985	3,708,610	1,175,500	4,884,110	10.22	4.00	8.72
1986	4,256,390	1,350,590	5,606,980	10.13	4.00	8.65
1987	4,204,010	1,595,820	5,799,830	10.15	4.00	8.46
1988	4,264,730	1,877,690	6,142,420	9.90	4.99	8.40
1989	4,705,320	1,936,500	6,641,820	9.94	6.44	8.92
1990	4,719,730	2,251,450	6,971,180	9.72	5.91	8.49
1991	4,584,460	2,289,430	6,873,890	9.65	5.76	8.35
1992	3,980,120	2,533,760	6,513,880	10.44	5.69	8.59
1993	3,764,520	2,359,710	6,124,230	10.48	6.28	8.86
1994	3,997,820	2,432,480	6,430,300	10.53	6.60	9.04
1995	3,933,110	2,656,020	6,589,130	10.61	6.06	8.78

Sources: Department of Business, Economic Development & Tourism, *State of Hawaii Data Book*, 1987 and 1993-94; Hawaii Visitors and Convention Bureau.

Table C-6. Visitor Rooms by County, 1965–1996

Year	Oahu	Hawaii County	Maui County	Kauai County	State Total
1965	10,031	865	1,231	776	12,903
1966	11,083	1,387	1,497	860	14,827
1967	12,598	1,790	1,714	1,115	17,217
1968	13,166	2,188	2,043	1,260	18,657
1969	15,992	2,480	2,415	1,914	22,801
1970	18,449	3,166	2,743	2,565	26,923
1971	22,531	3,435	3,695	2,628	32,289
1972	24,742	4,241	4,095	2,719	35,797
1973	25,108	4,796	4,075	2,629	36,608
1974	25,365	5,234	5,208	2,868	38,675
1975	25,352	5,348	5,830	3,102	39,632
1976	25,851	6,045	7,232	3,520	42,648
1977	27,363	5,929	8,037	3,657	44,986
1978	28,546	6,002	8,736	3,786	47,070
1979	30,065	6,093	9,472	4,202	49,832
1980	34,334	5,889	9,701	4,322	54,246
1981	33,967	6,705	11,359	4,738	56,769
1982	33,492	7,167	12,162	5,147	57,968
1983	34,354	7,469	12,749	4,193	58,765
1984	36,848	7,149	13,138	5,313	62,448
1985	38,600	7,511	14,152	5,656	65,919
1986	39,010	7,280	14,096	5,922	66,308
1987	38,185	7,328	13,849	5,956	65,318
1988	37,841	8,823	15,168	7,180	69,012
1989	36,467	8,161	15,708	7,398	67,734
1990	36,899	8,952	17,869	7,546	71,266
1991	36,623	9,383	18,702	7,567	72,275
1992	36,851	9,170	19,290	7,778	73,089
1993	36,604	9,140	19,127	4,631	69,502
1994	36,194	9,595	18,804	5,870	70,463
1996	36,146	9,558	17,824	6,760	70,288

Note: Hawaii Visitors and Convention Bureau did not conduct an update survey in 1995.
Time shares and condo units are included in the total count of hotel units.

Source: Hawaii Visitors and Convention Bureau.

APPENDIX D
PROJECTIONS OF POPULATION BY AGE, SEX,
AND MILITARY STATUS

TABLE D-1. Hawaii State Population Projection, 1995

Age	Other civilian population (excludes military dependents)			Resident population (includes military & dependents)		
	Total	Male	Female	Total	Male	Female
0-4	81,023	41,498	39,525	95,196	48,928	46,268
5-9	74,940	38,493	36,447	84,715	43,588	41,127
10-14	75,455	38,813	36,642	81,292	41,959	39,333
15-19	72,289	36,408	35,881	78,763	40,557	38,206
20-24	60,104	29,793	30,311	82,042	45,347	36,695
25-29	61,629	31,013	30,616	81,253	42,820	38,433
30-34	82,436	41,698	40,738	95,360	49,057	46,303
35-39	91,765	46,311	45,454	100,803	51,707	49,096
40-44	91,343	46,011	45,332	96,139	48,973	47,166
45-49	79,202	39,761	39,441	81,043	40,773	40,270
50-54	60,579	29,631	30,948	61,460	30,132	31,328
55-59	47,035	21,959	25,076	47,337	22,072	25,265
60-64	44,834	21,089	23,745	45,103	21,206	23,897
65-69	47,468	21,692	25,776	47,660	21,772	25,888
70-74	41,285	19,673	21,612	41,404	19,698	21,706
75-79	29,042	13,511	15,531	29,106	13,529	15,577
80-84	17,155	7,966	9,189	17,199	7,996	9,203
>85	13,323	5,695	7,628	13,323	5,695	7,628
Total	1,070,907	531,015	539,892	1,179,198	595,809	583,389
Median age	36.5	35.8	37.2	34.5	33.5	35.5
Distribution by age (percent)						
0-4	7.6	7.8	7.3	8.1	8.2	7.9
5-9	7.0	7.2	6.8	7.2	7.3	7.0
10-14	7.0	7.3	6.8	6.9	7.0	6.7
15-19	6.8	6.9	6.6	6.7	6.8	6.5
20-24	5.6	5.6	5.6	7.0	7.6	6.3
25-29	5.8	5.8	5.7	6.9	7.2	6.6
30-34	7.7	7.9	7.5	8.1	8.2	7.9
35-39	8.6	8.7	8.4	8.5	8.7	8.4
40-44	8.5	8.7	8.4	8.2	8.2	8.1
45-49	7.4	7.5	7.3	6.9	6.8	6.9
50-54	5.7	5.6	5.7	5.2	5.1	5.4
55-59	4.4	4.1	4.6	4.0	3.7	4.3
60-64	4.2	4.0	4.4	3.8	3.6	4.1
65-69	4.4	4.1	4.8	4.0	3.7	4.4
70-74	3.9	3.7	4.0	3.5	3.3	3.7
75-79	2.7	2.5	2.9	2.5	2.3	2.7
80-84	1.6	1.5	1.7	1.5	1.3	1.6
>85	1.2	1.1	1.4	1.1	1.0	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

TABLE D-2. Hawaii State Population Projection, 2000

Age	Other civilian population (excludes military dependents)			Resident population (includes military & dependents)		
	Total	Male	Female	Total	Male	Female
0-4	75,921	39,181	36,739	90,094	46,611	43,482
5-9	82,964	41,955	41,008	92,738	47,049	45,688
10-14	76,729	39,398	37,331	82,566	42,544	40,022
15-19	74,718	38,095	36,622	81,192	42,244	38,947
20-24	74,074	37,490	36,583	96,011	53,043	42,967
25-29	62,790	31,327	31,462	82,414	43,134	39,279
30-34	63,810	32,049	31,760	76,733	39,407	37,325
35-39	84,507	42,710	41,797	93,545	48,106	45,439
40-44	93,672	47,280	46,391	98,467	50,242	48,224
45-49	91,343	45,860	45,482	93,184	46,872	46,311
50-54	78,132	38,990	39,142	79,013	39,491	39,522
55-59	60,127	29,194	30,932	60,429	29,307	31,121
60-64	46,887	21,626	25,260	47,156	21,743	25,412
65-69	43,208	19,980	23,227	43,400	20,060	23,339
70-74	43,935	19,500	24,434	44,054	19,525	24,528
75-79	36,070	16,626	19,444	36,134	16,644	19,490
80-84	23,044	10,155	12,889	23,088	10,185	12,903
>85	18,283	7,872	10,411	18,283	7,872	10,411
Total	1,130,214	559,288	570,914	1,238,501	624,079	614,410
Median age	38.2	37.4	39.1	35.9	34.7	37.1
Distribution by age (percent)						
0-4	6.7	7.0	6.4	7.3	7.5	7.1
5-9	7.3	7.5	7.2	7.5	7.5	7.4
10-14	6.8	7.0	6.5	6.7	6.8	6.5
15-19	6.6	6.8	6.4	6.6	6.8	6.3
20-24	6.6	6.7	6.4	7.8	8.5	7.0
25-29	5.6	5.6	5.5	6.7	6.9	6.4
30-34	5.6	5.7	5.6	6.2	6.3	6.1
35-39	7.5	7.6	7.3	7.6	7.7	7.4
40-44	8.3	8.5	8.1	8.0	8.1	7.8
45-49	8.1	8.2	8.0	7.5	7.5	7.5
50-54	6.9	7.0	6.9	6.4	6.3	6.4
55-59	5.3	5.2	5.4	4.9	4.7	5.1
60-64	4.1	3.9	4.4	3.8	3.5	4.1
65-69	3.8	3.6	4.1	3.5	3.2	3.8
70-74	3.9	3.5	4.3	3.6	3.1	4.0
75-79	3.2	3.0	3.4	2.9	2.7	3.2
80-84	2.0	1.8	2.3	1.9	1.6	2.1
>85	1.6	1.4	1.8	1.5	1.3	1.7
Total	100	100	100	100	100	100

TABLE D-3. Hawaii State Population Projection, 2005

Age	Other civilian population (excludes military dependents)			Resident population (includes military & dependents)		
	Total	Male	Female	Total	Male	Female
0-4	77,989	40,275	37,713	92,162	47,705	44,456
5-9	78,495	39,832	38,662	88,269	44,926	43,342
10-14	85,833	43,272	42,560	91,670	46,418	45,251
15-19	76,028	38,673	37,355	82,502	42,822	39,680
20-24	76,880	39,328	37,552	98,817	54,881	43,936
25-29	78,243	39,950	38,293	97,867	51,757	46,110
30-34	66,178	32,996	33,182	79,101	40,354	38,747
35-39	67,251	33,839	33,412	76,289	39,235	37,054
40-44	87,759	44,451	43,307	92,554	47,413	45,140
45-49	94,488	47,577	46,910	96,329	48,589	47,739
50-54	90,323	45,077	45,246	91,204	45,578	45,626
55-59	77,714	38,503	39,211	78,016	38,616	39,400
60-64	60,259	28,910	31,348	60,528	29,027	31,500
65-69	45,693	20,754	24,938	45,885	20,834	25,050
70-74	40,203	18,086	22,116	40,322	18,111	22,210
75-79	38,627	16,598	22,028	38,691	16,616	22,074
80-84	28,752	12,577	16,175	28,796	12,607	16,189
>85	25,040	10,439	14,600	25,040	10,439	14,600
Total	1,195,755	591,137	604,608	1,304,042	655,928	648,104
Median age	39.3	38.1	40.4	36.4	34.9	38
Distribution by age (percent)						
0-4	6.5	6.8	6.2	7.1	7.3	6.9
5-9	6.6	6.7	6.4	6.8	6.8	6.7
10-14	7.2	7.3	7.0	7.0	7.1	7.0
15-19	6.4	6.5	6.2	6.3	6.5	6.1
20-24	6.4	6.7	6.2	7.6	8.4	6.8
25-29	6.5	6.8	6.3	7.5	7.9	7.1
30-34	5.5	5.6	5.5	6.1	6.2	6.0
35-39	5.6	5.7	5.5	5.9	6.0	5.7
40-44	7.3	7.5	7.2	7.1	7.2	7.0
45-49	7.9	8.0	7.8	7.4	7.4	7.4
50-54	7.6	7.6	7.5	7.0	6.9	7.0
55-59	6.5	6.5	6.5	6.0	5.9	6.1
60-64	5.0	4.9	5.2	4.6	4.4	4.9
65-69	3.8	3.5	4.1	3.5	3.2	3.9
70-74	3.4	3.1	3.7	3.1	2.8	3.4
75-79	3.2	2.8	3.6	3.0	2.5	3.4
80-84	2.4	2.1	2.7	2.2	1.9	2.5
>85	2.1	1.8	2.4	1.9	1.6	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

TABLE D-4. Hawaii State Population Projection, 2010

Age	Other civilian population (excludes military dependents)			Resident population (includes military & dependents)		
	Total	Male	Female	Total	Male	Female
0-4	82,975	42,854	40,120	97,148	50,284	46,863
5-9	80,419	40,886	39,532	90,193	45,980	44,212
10-14	81,196	41,077	40,119	87,033	44,223	42,810
15-19	85,138	42,567	42,570	91,612	46,716	44,895
20-24	78,068	39,836	38,232	100,005	55,389	44,616
25-29	80,784	41,621	39,163	100,408	53,428	46,980
30-34	81,314	41,419	39,894	94,237	48,777	45,459
35-39	69,371	34,635	34,735	78,409	40,031	38,377
40-44	70,424	35,549	34,875	75,219	38,511	36,708
45-49	88,552	44,742	43,810	90,393	45,754	44,639
50-54	93,415	46,768	46,647	94,296	47,269	47,027
55-59	89,598	44,427	45,170	89,900	44,540	45,359
60-64	77,250	37,848	39,402	77,519	37,965	39,554
65-69	58,478	27,673	30,804	58,670	27,753	30,916
70-74	42,652	18,905	23,747	42,771	18,930	23,841
75-79	35,454	15,480	19,974	35,518	15,498	20,020
80-84	31,011	12,616	18,394	31,055	12,646	18,408
>85	32,384	13,139	19,244	32,384	13,139	19,244
Total	1,258,483	622,042	636,432	1,366,770	686,833	679,928
Median age	39.3	38	40.6	36.5	34.9	38.1
Distribution by age (percent)						
0-4	6.6	6.9	6.3	7.1	7.3	6.9
5-9	6.4	6.6	6.2	6.6	6.7	6.5
10-14	6.5	6.6	6.3	6.4	6.4	6.3
15-19	6.8	6.8	6.7	6.7	6.8	6.6
20-24	6.2	6.4	6.0	7.3	8.1	6.6
25-29	6.4	6.7	6.2	7.3	7.8	6.9
30-34	6.5	6.7	6.3	6.9	7.1	6.7
35-39	5.5	5.6	5.5	5.7	5.8	5.6
40-44	5.6	5.7	5.5	5.5	5.6	5.4
45-49	7.0	7.2	6.9	6.6	6.7	6.6
50-54	7.4	7.5	7.3	6.9	6.9	6.9
55-59	7.1	7.1	7.1	6.6	6.5	6.7
60-64	6.1	6.1	6.2	5.7	5.5	5.8
65-69	4.6	4.4	4.8	4.3	4.0	4.5
70-74	3.4	3.0	3.7	3.1	2.8	3.5
75-79	2.8	2.5	3.1	2.6	2.3	2.9
80-84	2.5	2.0	2.9	2.3	1.8	2.7
>85	2.6	2.1	3.0	2.4	1.9	2.8
Total	100	100	100	100	100	100

TABLE D-5. Hawaii State Population Projection, 2015

Age	Other civilian population (excludes military dependents)			Resident population (includes military & dependents)		
	Total	Male	Female	Total	Male	Female
0-4	88,562	45,728	42,834	102,735	53,158	49,577
5-9	85,447	43,478	41,969	95,221	48,572	46,649
10-14	83,178	42,153	41,025	89,015	45,299	43,716
15-19	80,515	40,376	40,139	86,989	44,525	42,464
20-24	87,181	43,727	43,453	109,118	59,280	49,837
25-29	82,047	42,176	39,870	101,671	53,983	47,687
30-34	83,893	43,098	40,795	96,816	50,456	46,360
35-39	84,436	42,976	41,460	93,474	48,372	45,102
40-44	72,603	36,372	36,231	77,398	39,334	38,064
45-49	71,497	36,018	35,478	73,338	37,030	36,307
50-54	87,650	44,031	43,618	88,531	44,532	43,998
55-59	92,698	46,124	46,574	93,000	46,237	46,763
60-64	88,871	43,604	45,266	89,140	43,721	45,418
65-69	74,813	36,198	38,615	75,005	36,278	38,727
70-74	54,632	25,310	29,321	54,751	25,335	29,415
75-79	37,812	16,301	21,511	37,876	16,319	21,557
80-84	28,507	11,802	16,705	28,551	11,832	16,719
>85	37,914	14,517	23,396	37,914	14,517	23,396
Total	1,322,256	653,989	668,260	1,430,543	718,780	711,756
Median age	39.2	38.1	40.4	36.8	35.4	38.3

Distribution by age (percent)

0-4	6.7	7.0	6.4	7.2	7.4	7.0
5-9	6.5	6.6	6.3	6.7	6.8	6.6
10-14	6.3	6.4	6.1	6.2	6.3	6.1
15-19	6.1	6.2	6.0	6.1	6.2	6.0
20-24	6.6	6.7	6.5	7.6	8.2	7.0
25-29	6.2	6.4	6.0	7.1	7.5	6.7
30-34	6.3	6.6	6.1	6.8	7.0	6.5
35-39	6.4	6.6	6.2	6.5	6.7	6.3
40-44	5.5	5.6	5.4	5.4	5.5	5.3
45-49	5.4	5.5	5.3	5.1	5.2	5.1
50-54	6.6	6.7	6.5	6.2	6.2	6.2
55-59	7.0	7.1	7.0	6.5	6.4	6.6
60-64	6.7	6.7	6.8	6.2	6.1	6.4
65-69	5.7	5.5	5.8	5.2	5.0	5.4
70-74	4.1	3.9	4.4	3.8	3.5	4.1
75-79	2.9	2.5	3.2	2.6	2.3	3.0
80-84	2.2	1.8	2.5	2.0	1.6	2.3
>85	2.9	2.2	3.5	2.7	2.0	3.3
Total	100	100	100	100	100	100

TABLE D-6. Hawaii State Population Projection, 2020

Age	Other civilian population (excludes military dependents)			Resident population (includes military & dependents)		
	Total	Male	Female	Total	Male	Female
0-4	91,883	47,451	44,432	106,056	54,881	51,175
5-9	91,080	46,358	44,721	100,854	51,452	49,401
10-14	88,248	44,768	43,479	94,085	47,914	46,170
15-19	82,484	41,438	41,045	88,958	45,587	43,370
20-24	82,634	41,589	41,045	104,571	57,142	47,429
25-29	91,202	46,086	45,115	110,826	57,893	52,932
30-34	85,211	43,677	41,533	98,134	51,035	47,098
35-39	87,040	44,651	42,389	96,078	50,047	46,031
40-44	87,584	44,632	42,952	92,379	47,594	44,785
45-49	73,703	36,853	36,850	75,544	37,865	37,679
50-54	70,933	35,517	35,415	71,814	36,018	35,795
55-59	87,156	43,520	43,636	87,458	43,633	43,825
60-64	91,999	45,315	46,683	92,268	45,432	46,835
65-69	86,067	41,748	44,318	86,259	41,828	44,430
70-74	69,952	33,206	36,745	70,071	33,231	36,839
75-79	48,568	21,948	26,619	48,632	21,966	26,665
80-84	30,637	12,540	18,097	30,681	12,570	18,111
>85	39,476	14,769	24,707	39,476	14,769	24,707
Total	1,385,857	686,066	699,781	1,494,144	750,857	743,277
Median age	39.6	38.5	40.7	37.3	36	38.7
Distribution by age (percent)						
0-4	6.6	6.9	6.3	7.1	7.3	6.9
5-9	6.6	6.8	6.4	6.7	6.9	6.6
10-14	6.4	6.5	6.2	6.3	6.4	6.2
15-19	6.0	6.0	5.9	6.0	6.1	5.8
20-24	6.0	6.1	5.9	7.0	7.6	6.4
25-29	6.6	6.7	6.4	7.4	7.7	7.1
30-34	6.1	6.4	5.9	6.6	6.8	6.3
35-39	6.3	6.5	6.1	6.4	6.7	6.2
40-44	6.3	6.5	6.1	6.2	6.3	6.0
45-49	5.3	5.4	5.3	5.1	5.0	5.1
50-54	5.1	5.2	5.1	4.8	4.8	4.8
55-59	6.3	6.3	6.2	5.9	5.8	5.9
60-64	6.6	6.6	6.7	6.2	6.1	6.3
65-69	6.2	6.1	6.3	5.8	5.6	6.0
70-74	5.0	4.8	5.3	4.7	4.4	5.0
75-79	3.5	3.2	3.8	3.3	2.9	3.6
80-84	2.2	1.8	2.6	2.1	1.7	2.4
>85	2.8	2.2	3.5	2.6	2.0	3.3
Total	100	100	100	100	100	100

APPENDIX E
EQUATION LISTING FOR THE STATE AND
COUNTY SUBMODELS

1. STATE MODEL EQUATIONS

Final demand submodel

$$GSP_t = FSALES_t - IMPORTS_t$$

$$FSALES_t = PCE_t + INVS_t + INVOTHER_t + SLEXP_t + SLCONST_t + FEDCIVIL_t \\ + DEFENSE_t + VE_t + EXPORTS_t$$

$$PCE_t = 10973.26 + 0.337935DISP_t - 108.5341DUM95 + [AR(1) = 0.958709] \\ (1.63) \quad (2.04) \quad (-0.47) \quad (27.10)$$

$$R^2 = 0.99$$

$$D-W = 1.59$$

$$INVS_t = 782.3829 + 63.17794 ((PRHUNITS_t - PRHUNITS_{t-1}) + (VUNITS_t - VUNITS_{t-1})) \\ (3.14) \\ + 811.8DUM91 - 564.9219DUM95 \\ (8.26) \quad (-2.76)$$

$$R^2 = 0.88$$

$$D-W = 1.88$$

$$PRHUNITS_t = THUNITS_t - FEDUNITS_t - SLUNITS_t$$

$$THUNITS_t = POP_t / (POPHRATIO_t)$$

$$FEDUNITS_t = FEDUNITS_{1995}$$

$$SLUNITS_t = 1.774614 + 0.005215POP_t + 1.4126DUM95 \\ (2.80) \quad (3.60)$$

$$R^2 = 0.90$$

$$D-W = 1.38$$

$$INVOTHER_t = -497.0266 + 0.100157DISP_t - 10.6003DUM95 + [AR(1) = 0.817263] \\ (2.81) \quad (-0.11) \quad (6.82)$$

$$R^2 = 0.91$$

$$D-W = 1.74$$

$$SLEXP_t = 327.9744 + 0.154698DISP_t - 86.12932DUM95 + [AR(1)=0.468768] \\ (1.57) \quad (10.43) \quad (-0.73) \quad (2.41)$$

$$R^2 = 0.96$$

$$D-W = 1.97$$

$$SLCONST_t = SLCONST_{1995}$$

$$DEFENSE_t = 2177.258 + 0.058868DISP_{t-1} \\ (12.66) \quad (5.30)$$

$$R^2 = 0.70$$

$$D-W = 1.61$$

$$DEFOTHER_t = DEFENSE_t - DEFCONST_t$$

$$DEFCONST_t = DEFCONST_{1995}$$

$$FEDCIVIL_t = 3.341333 + 0.033707DISPI_t$$

(0.07) (12.51)

$$R^2 = 0.95$$

$$D-W = 1.54$$

$$VE_t = EXO$$

$$EXPORTS_t = \frac{\sum_{i=1}^{20} OUTPUT_{t,i} \times EXSHARE_i}{0.3763}$$

$$IMPORT_t = -1539.306 + 0.910854DISPI_t - 488.0647DUM95 + [AR(1) = 0.705042]$$

(-1.33) (7.79) (-0.56) (4.31)

$$R^2 = 0.97$$

$$D-W = 1.56$$

where:

GSP_t = Gross state product

FSALES_t = Final sales

PCE_t = Personal consumption expenditures

INVS_t = Private investment in structures

INVOTHER_t = Private other investment

SLEXP_t = State and local government other expenditures

SLCONST_t = State and local government construction expenditures

FEDCIVIL_t = Federal civilian expenditures

DEFENSE_t = Federal defense expenditures

VE_t = Visitor expenditures

EXPORTS_t = Non-tourism exports

IMPORTS_t = Imports

DISPI_t = Disposable personal income

PRHUNITS_t = Private housing units

VUNITS_t = Number of visitor units, including hotel and condo units

DUM91 = Dummy variable, DUM91 = 1 if year = 1991; DUM91 = 0 otherwise

DUM95 = Dummy variable, DUM95 > 1 if year ≥ 1995; DUM95 = 0 otherwise

THUNITS_t = Total housing units

POP_t = Resident population

POPHRATIO_t = Ratio between resident population and housing units

FEDUNITS_t = Federal housing units

SLUNITS_t = State and local government housing units

DEFCONST_t = Defense construction expenditures

DEFOTHER_t = Federal defense other expenditures

OUTPUT_{t,i} = Output of industry i at year t

EXSHARE_i = Ratio between export and output for industry i

EXO = Exogenous

R² = Coefficient of determination

D-W = Durbin - Watson statistics

AR(1) = Coefficient for first order serially correlated errors

Subscript t represents current year and t-1 represents previous year

Numbers in parentheses are t - statistics

Output submodel

$$TOUTPUT_t = \sum_{i=1}^{20} OUTPUT_{t,i}$$

$$OUTPUT_{t,i} = \sum_{j=1}^{20} FD_{t,j} \times INVCOEF_{i,j} + ADJ_i$$

$$\begin{aligned} FD_{t,j} = & PCE_t \times FDCOEF_{j,PCE} + INVS_t \times FDCOEF_{j,INVS} + INVOTHER_t \times FDCOEF_{j,INVOTHER} \\ & + SLEXP_t \times FDCOEF_{j,SLEXP} + SLCONST_t \times FDCOEF_{j,SLCONST} \\ & + DEFCONST_t \times FDCOEF_{j,DEFCONST} + DEFOTHER_t \times FDCOEF_{j,DEFOTHER} \\ & + FEDCIVIL_t \times FDCOEF_{j,FEDCIVIL} + VE_t \times FDCOEF_{j,VE} \\ & + EXPORTS_t \times FDCOEF_{j,EXPORTS} \end{aligned}$$

$$ADJ_i = OUTPUT_{95,i} - \sum_{j=1}^{20} FD_{1995,j} \times INVCOEF_{i,j}$$

$$OUTPUT_{95,i} = OUTPUT_{87,i} \times \frac{LINCOME_{95,i}}{LINCOME_{87,i}}$$

where:

TOUTPUT_t = Total output

OUTPUT_{t,i} = Output of the ith industry

FD_{t,j} = Final demand of the jth industry

$INVCOEF_{i,j}$ = Total requirements coefficient derived from I-O table
 ADJ_i = Output adjustment factor for the i^{th} industry
 $FDCOEF_{j,PCE}$ = Factor of allocating personal consumption expenditures to industry j
 $FDCOEF_{j,INVS}$ = Factor of allocating private structural investment to industry j
 $FDCOEF_{j,INVOTHER}$ = Factor of allocating private other investment to industry j
 $FDCOEF_{j,SLEXP}$ = Factor of allocating state and local government expenditures to industry j
 $FDCOEF_{j,SLCONST}$ = Factor of allocating state and local government construction expenditures to industry j
 $FDCOEF_{j,DEFCONST}$ = Factor of allocating federal construction expenditures to industry j
 $FDCOEF_{j,DEFOTHER}$ = Factor of allocating federal other expenditures to industry j
 $FDCOEF_{j,FEDCIVIL}$ = Factor of allocating federal civilian expenditures to industry j
 $FDCOEF_{j,VE}$ = Factor of allocating visitor expenditures to industry j
 $FDCOEF_{j,EXPORTS}$ = Factor of allocating non-tourism exports to industry j
 $OUTPUT95_i$ = Estimated 1995 output
 $LINCOME_{95,i}$ = Labor income from industry i in 1995
 $LINCOME_{87,i}$ = Labor income from industry i in 1987
 Other variables and notations are as defined in previous sections

Employment submodel

$$LFORCE_t = LFPARTRT_t \times POPWORK_t$$

$$LFPARTRT_t = 25.93105 - 0.387863 UNEMPRT_t + 0.642951 LFPARTRT_{t-1}$$

(-2.31) (4.23)

$$R^2 = 0.74$$

$$D-W = 1.94$$

$$UNEMPRT_t = \frac{UNEMPLOY_t}{LFORCE_t}$$

$$UNEMPLOY_t = LFORCE_t - EMPLOYED_t$$

$$EMPLOYED_t = 19.22925 + 0.974901 WSJOBS_t + [AR(1) = 0.616043]$$

(15.93) (3.57)

$$R^2 = 0.99$$

$$D-W = 1.68$$

$$WSJOBS_t = \sum_{i=1}^{20} WSJOBS_{t,i}$$

$$WSJOBS_{t,i} = \frac{OUTPUT_{t,i}}{PRDRT_{t,i}}$$

$$\begin{aligned}
 PRDRT_{t,i} &= PRDRT_{t-1,i} \times (1 + WFACTOR_t / 100.0) \\
 SELFEMPLOY_t &= 8.466787 + 0.056594 WSJOBS_t - 1.99699DUM95 \\
 &\quad (4.00) \quad (-0.91) \\
 &\quad + [AR(1) = 0.608306] \\
 &\quad (3.81)
 \end{aligned}$$

$$R^2 = 0.85$$

$$D-W = 2.10$$

$$TJOBS_t = WSJOBS_t + SELFEMPLOY_t$$

where:

LFORCE_t = Labor force

POPWORK_t = Working age population , 16 years old and over

LFPARTRT_t = Labor force participation rate

UNEMPRT_t = Unemployment rate

UNEMPLOY_t = Number of people unemployed

EMPLOYED_t = Number of people employed

WSJOB_t = Wage and salary jobs at year t

WSJOB_{t,i} = Wage and salary jobs at year t for industry i

PRDRT_{t,i} = Productivity measure for industry i (\$output/job)

WFACTOR_t = Wage increasing factor

SELFEMPLOY_t = Self-employed jobs

TJOBS_t = Total civilian jobs

Other variables and notations are as defined in previous sections

Income submodel

$$DISPI_t = TPI_t - TAX_t$$

$$\begin{aligned}
 TAX_t &= -436.9192 + 0.160873TPI_t - 140.9778DUM95 + [AR(1) = 0.665510] \\
 &\quad (-1.28) \quad (8.03) \quad (-1.13) \quad (4.18)
 \end{aligned}$$

$$R^2 = 0.96$$

$$D-W = 1.85$$

$$TPI_t = LINCOME_t + TRANSF_t + DIRENT_t - SINSUR_t$$

$$LINCOME_t = \sum_{i=1}^{20} LINCOME_{t,i}$$

$$LINCOME_{t,i} = WSJOB_{t,i} \times INCOMERT_{t,i}$$

$$INCOMERT_{t,i} = INCOMERT_{t-1,i} \times (1 + WFACTOR_{t,i}/100.0)$$

$$WFACTOR_{t,i} = EXO$$

$$\begin{aligned} TRANSF_t = & -193.5641 + 9.583011UNEMPLOY_t + 12.31826POP65_t + 0.430203TRANSF_{t-1} \\ & (-2.08) \quad (3.65) \quad (4.71) \quad (3.49) \\ & + 127.5447DUM95 \\ & (1.70) \end{aligned}$$

$$R^2 = 0.99$$

$$D-W = 2.26$$

$$\begin{aligned} DIRENT_t = & -3763.376 + 6.081549POP_t + 30.66198DUM95 + [AR(1) = 0.677475] \\ & (-4.49) \quad (7.61) \quad (0.22) \quad (4.84) \end{aligned}$$

$$R^2 = 0.97$$

$$D-W = 1.67$$

$$\begin{aligned} SINSUR_t = & 1948.728 + 1.488390WSJOB_t - 14.57050DUM95 + [AR(1) = 0.993509] \\ & (0.23) \quad (4.67) \quad (-1.01) \quad (33.81) \end{aligned}$$

$$R^2 = 0.997$$

$$D-W = 1.96$$

where:

DISPI_t = Disposable personal income

TPI_t = Total personal income

TAX_t = Personal income taxes

LINCOME_t = Labor income

TRANSF_t = Transfer payments

DIRENT_t = Dividends, interest, and rental income

SINSUR_t = Personal contribution to social insurance

INCOMERT_{t,i} = Ratio between labor income and wage and salary jobs

POP65_t = Population 65 years and over

Other variables and notations are as defined in previous sections

Population submodel

$$POP_{t,i} = \sum_{i=0}^{85+} POP_{t,i}$$

$$POP_{t,i} = CIVILIAN_{t,i} + MILITARY_{t,i} + MILDEP_{t,i}$$

$$CIVILIAN_{t,i} = CIVILIAN_{t-1,i} + BIRTHS_t - DEATHS_t + NETMIG_t$$

$$BIRTHS_{t,i} = \sum_{i=14}^{49} BIRTHRT_{Boy,i} \times FEMALE_{t,i} + BIRTHRT_{Girl,i} \times FEMALE_{t,i}$$

$$DEATHS_{t,i} = \sum_{i=0}^{85+} CIVILIAN_{t-1,i} \times (1 - SURVIVRT_{t,i})$$

$$SURVIVRT_{t,i} = SURVIVRT_{t-1,i} \times SFACTOR_{t,i}$$

$$NETMIG_t = 0.948342 + 0.555379NMIG_{t-1} + 0.565036NMIG_{t-2} - 0.399548NMIG_{t-3} \\ + 0.109058(TJOBS_t - TJOBS_{t-1})$$

(3.52) (3.97) (-2.73) (2.28)

$$R^2 = 0.70$$

$$D-W = 1.9$$

$$NETMIG_{t,i} = NETMIG_t \times MIGDIST_i$$

$$MILITARY_t = MILITARY_{1995}$$

$$MILDEP_t = MILDEP_{1995}$$

$$POP5-11_t = \sum_{i=5}^{11} POP_{t,i}$$

$$POP12-13_t = \sum_{i=12}^{13} POP_{t,i}$$

$$POP14-17_t = \sum_{i=14}^{17} POP_{t,i}$$

$$POP65_t = \sum_{i=65}^{85+} POP_{t,i}$$

$$POPWORK_t = \sum_{i=16}^{85+} POP_{t,i}$$

where:

POP_t = Total resident population

$POP_{t,i}$ = Resident population of the i^{th} age

$CIVILIAN_{t,i}$ = Non-military civilian population age i

$MILITARY_t$ = Military personnel

$MILDEP_t$ = Military dependents

$BIRTHS_t$ = Births of non-military civilian population

$DEATHS_t$ = Deaths of non-military civilian population

$NETMIG_t$ = Net migration at year t

$BIRTHRT_{Boy,i}$ = Probability of giving birth to a boy for a female at age i

$BIRTHRT_{Girl,i}$ = Probability of giving birth to a girl for a female at age i

$FEMALE_i$ = Number of females at age i

$SURVIVRT_{t,i}$ = Survival rate at age i

$SFACTOR_{t,i}$ = Survival rate increasing factor for population at age i

$NETMIG_{t,i}$ = Net migration of age i at year t

$MIGDIST_i$ = Distribution factor of net migration to the i^{th} age group

POP5-11 = School age children 5 to 11 year

POP12-13 = School age children 12 to 13 years

POP14-17 = School age children 14 to 17 years

Other variables and notations are as defined in previous sections

2. COUNTY MODEL EQUATIONS

Honolulu County

$$\text{HPOP}_t = \text{HTJOBS}_t \times (-0.009420 + 0.995866 \text{SPOP}_t / \text{STJOBS}_t) \quad (34.18)$$

$$-0.007968 \text{DUM95} + [\text{AR}(1) = 0.677810] \\ (-1.09) \quad (5.34)$$

$$R^2 = 0.998$$

$$\text{D-W} = 1.64$$

$$\text{HTPI}_t = \text{HPOP}_t \times (-1.463839 + 1.139595 \text{STPI}_t / \text{SPOP}_t - 0.011049 \text{DUM95}) \\ (66.78) \quad (-0.07)$$

$$R^2 = 0.995$$

$$\text{D-W} = 1.85$$

$$\text{HPCPI}_t = \text{HTPI}_t / \text{HPOP}_t \times 1000.0$$

$$\text{HTJOBS}_t = \text{HWSJOBS}_t + \text{HSELFJOBS}_t$$

$$\text{HSELFJOBS}_t = \text{HTJOBS}_t \times (-0.005046 + 0.903206 \text{SSELFJOBS}_t / \text{STJOBS}_t) \\ (30.36) \\ -0.000562 \text{DUM95} + [\text{AR}(1) = 0.852971] \\ (-0.80) \quad (6.30)$$

$$R^2 = 0.991$$

$$\text{D-W} = 1.60$$

$$\text{HWSJOBS}_t = \sum_{i=1}^{11} \text{HWSJOBS}_{t,i}$$

$$\text{HAG}_t = \text{EXO}$$

$$\text{HMANUF}_t = 0.631488 + 0.709552 \text{SMANUF}_t + 0.187893 \text{DUM95} + [\text{AR}(1) = 0.433323] \\ (19.14) \quad (0.79) \quad (2.18)$$

$$R^2 = 0.984$$

$$\text{D-W} = 1.67$$

$$\text{HCONST}_t = \text{HBASIC}_t \times (0.005580 + 1.070886 \text{SCONST}_t / \text{SBASIC}_t + [\text{AR}(1) = 0.350608]) \\ (46.64) \quad (2.15)$$

$$R^2 = 0.996$$

$$\text{D-W} = 2.00$$

$$HBASIC_t = HAG_t + HMANUF_t + HEATING_t + HOTEL_t + HFED_t$$

$$SBASIC_t = SAG_t + SMANUF_t + SEATING_t + SHOTEL_t + SFED_t$$

$$HTRANS_t = HBASIC_t \times (0.032912 + 1.137827STRANS_t/SBASIC_t + [AR(1) = 0.977532])$$

(10.02) (14.42)

$$R^2 = 0.992$$

$$D-W = 1.25$$

$$HEATING_t = HETSHARE_t \times SEATING_t$$

$$HETSHARE_t = EXO$$

$$HTRADE_t = HBASIC_t \times (0.088802 + 0.945136STRADE_t/SBASIC_t + [AR(1) = 0.716670])$$

(11.67) (5.06)

$$R^2 = 0.978$$

$$D-W = 2.04$$

$$HFINANCE_t = HBASIC_t \times (0.002053 + 1.179994SFINANCE_t/SBASIC_t + [AR(1) = 0.738521])$$

(21.81) (5.04)

$$R^2 = 0.994$$

$$D-W = 1.52$$

$$HHOTEL_t = HHSHARE_t \times SHOTEL_t$$

$$HSERVICE_t = HBASIC_t \times (0.014794 + 1.150255SSERVICE_t/SBASIC_t + [AR(1) = 0.816677])$$

(25.22) (5.37)

$$R^2 = 0.999$$

$$D-W = 1.50$$

$$HSLG_t = HBASIC_t \times (0.046625 + 1.017798SSLG_t/SBASIC_t + [AR(1) = 0.935114])$$

(22.86) (17.72)

$$R^2 = 0.996$$

$$D-W = 1.26$$

$$HFEDG_t = 0.046014 + 0.989622SFEDG_t - 1.010187SFEDG_{t-1} + 1.018629HFEDG_{t-1} + 0.04139DUM95$$

(37.04) (-13.73) (14.17) (0.44)

$$R^2 = 0.997$$

$$D-W = 2.36$$

where:

HPOP_t = Honolulu county population

HTPI_t = Honolulu county total personal income

$HPCPI_t$ = Honolulu county per capita personal income
 $HTJOBS_t$ = Honolulu county total jobs
 $HSELFJOBS_t$ = Honolulu county self employed jobs
 $HWSJOBS_t$ = Honolulu county wage and salary jobs
 HAG_t = Honolulu county agriculture jobs
 $HMANUF_t$ = Honolulu county manufacturing jobs
 $HCONST_t$ = Honolulu county construction jobs
 $HBASIC_t$ = Honolulu county basic jobs
 $HTRANS_t$ = Honolulu county transportation, communication, and utility jobs
 $HEATING_t$ = Honolulu county eating and drinking jobs
 $HESHARE_t$ = Honolulu county eating and drinking job share
 $HTRADE_t$ = Honolulu county trade (excluding Eating and drinking) jobs
 $HFINANCE_t$ = Honolulu county finance, insurance, and real estate jobs
 $HHOTEL_t$ = Honolulu county hotel jobs
 $HHSHARE_t$ = Honolulu county hotel job share
 $HSERVICE_t$ = Honolulu county other services jobs
 $HSLG_t$ = Honolulu county State and local government jobs
 $HFEDG_t$ = Honolulu county Federal government jobs
 $SPOP_t$ = State total population
 $STJOBS_t$ = State total jobs
 $STPI_t$ = State total personal income
 $SSELFJOBS_t$ = State self employed jobs
 SAG_t = State agriculture jobs
 $SMANUF_t$ = State manufacturing jobs
 $SCONST_t$ = State construction jobs
 $STRANS_t$ = State transportation, communication, and utility jobs
 $SEATING_t$ = State eating and drinking jobs
 $STRADE_t$ = State trade (excluding Eating and drinking) jobs
 $SFINANCE_t$ = State finance, insurance, and real estate jobs
 $SHOTEL_t$ = State hotel jobs
 $SSERVICE_t$ = State other services jobs
 $SSLG_t$ = State state and local government jobs
 $SFEDG_t$ = State Federal government jobs
 $SBASIC_t$ = State basic jobs
 Other variables and notations are as defined in previous sections

Maui County

$$\begin{aligned}
 MPOP_t = & MTJOBS_t \times (-0.642927 + 1.252953 SPOP_t / STJOBS_t \\
 & \quad \quad \quad (10.78) \\
 & -0.009953 DUM95 + [AR(1) = 0.599870] \\
 & \quad \quad \quad (-0.25) \quad \quad \quad (3.14)
 \end{aligned}$$

$$R^2 = 0.968$$

$$D-W = 1.35$$

$$MTPI_t = MPOP_t \times (-1.551880 + 1.011226STPI_t/SPOP_t + 0.288787DUM95) \\ (19.0) \quad (0.52)$$

$$R^2 = 0.95$$

$$D-W = 1.56$$

$$MPCPI_t = MTPI_t/MPOP_t \times 1000.0$$

$$MTJOBS_t = MWSJOBS_t + MSELFJOBS_t$$

$$MSEFLJOBS_t = MTJOBS_t \times (0.046252 + 0.59792SSELFJOBS_t/STJOBS_t \\ (3.08) \\ + 0.003136DUM95 + [AR(1)=0.805286]) \\ (0.76) \quad (11.52)$$

$$R^2 = 0.890$$

$$D-W = 1.53$$

$$MWSJOBS_t = \sum_{i=1}^{11} MWSJOBS_i$$

$$MAG_t = EXO$$

$$MMANUF_t = 0.103SMANUF_t$$

$$MCONST_t = 0.076 \times (1 + 0.002)^t \times SCONST_t$$

$$MTRANS_t = MBASIC_t \times (-0.026116 + 1.193799STRANS_t/SBASIC_t \\ (4.53) \\ + 0.571156STRANS_{t-1}/SBASIC_{t-1}) \\ (-2.08)$$

$$R^2 = 0.87$$

$$D-W = 1.61$$

$$MEATING_t = MESHARE_t \times SEATING_t$$

$$MTRADE_t = MBASIC_t \times (-0.013523 + 0.712999STRADE_t/SBASIC_t + \\ (2.43) \\ [AR(1)=0.876849] \\ (11.38)$$

$$R^2 = 0.947$$

$$D-W = 1.60$$

$$MFINANCE_t = MBASIC_t \times (0.106041 + 0.186019SFINANCE_t/SBASIC_t \\ (1.64) \\ + [AR(1) = 0.788396] \\ (10.27)$$

$$R^2 = 0.87$$

$$D-W = 1.98$$

$$MHOTEL_t = MSHARE_t \times SHOTEL_t$$

$$MSERVICE_t = MBASIC_t \times (-0.054349 + 0.601094SSERVICE_t/SBASIC_t) \quad (7.45)$$

$$+ [AR(1)=0.768839] \quad (5.18)$$

$$R^2 = 0.977$$

$$D-W = 1.34$$

$$MSLG_t = 0.086 \times (1 + 0.005)^t \times SSLG_t$$

$$MFEDG_t = 0.015 \times (1 + 0.005)^t \times SFEDG_t$$

where:

MPOP_t = Maui county population

MTPI_t = Maui county total personal income

MPCPI_t = Maui county per capita personal income

MTJOBS_t = Maui county total jobs

MWSJOBS_t = Maui county wage and salary jobs

MSELFJOBS_t = Maui county self employed jobs

MAG_t = Maui county agriculture jobs

MMANUF_t = Maui county manufacturing jobs

MCONST_t = Maui county construction jobs

MTRANS_t = Maui county transportation, communication, and utility jobs

MEATING_t = Maui county eating and drinking jobs

MESHARE_t = Maui county eating and drinking job share

MTRADE_t = Maui county trade (excluding Eating and drinking) jobs

MFINANCE_t = Maui county finance, insurance, and real estate jobs

MHOTEL_t = Maui county hotel jobs

MSHARE_t = Maui county hotel job share

MSERVICE_t = Maui county other services jobs

MSLG_t = Maui county State and local government jobs

MFEDG_t = Maui county Federal government jobs

MBASIC_t = Maui county basic jobs

Other variables and notations are as defined in previous sections

Hawaii County

$$BPOP_t = BTJOBS_t \times (-0.094360 + 1.207446SPOP_t/STJOBS_t) \quad (5.07)$$

$$+ 0.056282DUM95 + [AR(1) = 0.865993] \quad (1.35) \quad (13.47)$$

$$\text{D-W} = 1.87$$

$$\begin{aligned} \text{BTPI}_t = & \text{BPOP}_t \times (5.340513 + 0.451681\text{STPI}_t/\text{SPOP}_t - 0.247939\text{DUM95} \\ & \quad (8.63) \quad \quad \quad (-0.86) \\ & + [\text{AR}(1) = 0.445909]) \\ & \quad (2.15) \end{aligned}$$

$$R^2 = 0.94$$

$$D-W = 1.87$$

$$\begin{aligned} \text{BPCPI}_t &= \text{BTPI}_t / \text{BPOP}_t \times 1000.0 \\ \text{BTJOBS}_t &= \text{BWSJOBS}_t + \text{BSELFJOBS}_t \\ \text{BSELFJOBS}_t &= \text{BTJOBS}_t \times (0.016497 + 1.793503 \text{SSELFJOBS}_t / \text{STJOBS}_t \\ &\quad (9.07) \\ &\quad - 0.000177 \text{DUM95} + [\text{AR}(1) = 0.864205]) \\ &\quad (-0.04) \quad (6.46) \end{aligned}$$

$$R^2 = 0.942$$

D-W = 1.79

$$\text{BWSJOBS}_t = \sum_{i=1}^{11} \text{BWSJOBS}_i$$

$$\text{BAG}_t = \text{EXO}$$

$$\text{BMANUF}_t = -0.4816 + 0.140168\text{SMANUF}_t - 0.169666\text{DUM95} + [\text{AR}(1) = 0.582730] \quad (6.02) \quad (-1.43) \quad (3.33)$$

$$R^2 = 0.907$$

D-W = 1.58

$$\begin{aligned} \text{BCONST}_t &= 0.097 \times (1+0.016)^t \times \text{SCONST}_t \\ \text{BTRANS}_t &= \text{BBASIC}_t \times (0.004794 + 0.556680 \text{STRANS}_t / \text{SBASIC}_t + [\text{AR}(1) = 0.712076]) \end{aligned} \quad \begin{aligned} (2.09) \quad (3.71) \end{aligned}$$

$$R^2 = 0.72$$

D-W = 1.35

$$\text{BEATING}_t = \text{BESHARE}_t \times \text{SEATING}_t$$

$$\text{BTRADE}_t = -5.370807 + 0.156533\text{STRADE}_t + [\text{AR}(1) = 1.241947] + [\text{AR}(2) = 0.452483] \quad (9.78) \quad (6.86) \quad (-2.6)$$

$$R^2 = 0.993$$

D-W = 1.62

$$\begin{aligned} \text{BFINANCE}_t &= 0.062 \times (1 + 0.002)^t \times \text{SFINANCE}_t \\ \text{BHOTEL}_t &= \text{BSHARE}_t \times \text{SHOTEL}_t \\ \text{BSERVICE}_t &= 0.075 \times (1 + 0.005)^t \times \text{SSERVICE}_t \end{aligned}$$

$$\begin{aligned}BSLG_t &= 0.114 \times (1+0.0056)^t \times SSLG_t \\BFEG_t &= 0.029 \times (1+0.005)^t \times SFEDG_t\end{aligned}$$

where:

$BPOP_t$ = Hawaii county population
 $BTPI_t$ = Hawaii county total personal income
 $BPCPI_t$ = Hawaii county per capita personal income
 $BTJOBS_t$ = Hawaii county total jobs
 $BSELFJOBS_t$ = Hawaii county self employed jobs
 $BWSJOBS_t$ = Hawaii county wage and salary jobs
 BAG_t = Hawaii county agriculture jobs
 $BMANUF_t$ = Hawaii county manufacturing jobs
 $BCONST_t$ = Hawaii county construction jobs
 $BTRANS_t$ = Hawaii county transportation, communication, and utility jobs
 $BEATING_t$ = Hawaii county eating and drinking jobs
 $BESHARE_t$ = Hawaii county eating and drinking job share
 $BTRADE_t$ = Hawaii county trade (excluding Eating and drinking) jobs
 $BFINANCE_t$ = Hawaii county finance, insurance, and real estate jobs
 $BHOTEL_t$ = Hawaii county hotel jobs
 $BHSHARE_t$ = Hawaii county hotel job share
 $BSERVICE_t$ = Hawaii county other services jobs
 $BSLG_t$ = Hawaii county State and local government jobs
 $BFEDG_t$ = Hawaii county Federal government jobs
 $BBASIC_t$ = Hawaii county basic jobs
 Other variables and notations are as defined in previous sections

Kauai County

$$\begin{aligned}KPOP_t = & -36.91739 + 0.166810KTJOBS_t + 0.075221SPOP_t - 0.171116DUM95 \\ & (2.11) \qquad \qquad \qquad (13.75) \qquad \qquad \qquad (-0.50) \\ & + [AR(1)=0.776448] \\ & \qquad \qquad \qquad (13.93)\end{aligned}$$

$$R^2 = 0.999$$

$$D-W = 2.09$$

$$\begin{aligned}KTPI_t = & KPOP_t \times (-2.483722 + 1.000340STPI_t/SPOP_t - 5.886273DUM92 \\ & \qquad \qquad \qquad (12.18) \qquad \qquad \qquad (11.88) \\ & + 0.005374DUM95) \\ & \qquad \qquad \qquad (0.01)\end{aligned}$$

$$R^2 = 0.953$$

$$D-W = 1.20$$

$$KPCPI_t = KTPI_t / KPOP_t \times 1000.0$$

$$KTJOBS_t = KWSJOBS_t + KSEELFJOBS_t$$

$$KSELFJOBS_t = KTJOBS_t \times (-0.020758 + 1.530668SSELFJOBS_t / STJOBS_t \\ (11.33) \\ -0.000888DUM95 + [AR(1) = 0.7579]) \\ (0.33) \quad (5.68)$$

$$R^2 = 0.934$$

$$D-W = 1.89$$

$$KWSJOBS_t = \sum_{i=1}^{11} KWSJOBS_i$$

$$KAG_t = EXO$$

$$KMANUF_t = 0.029 \times SMANUF_t$$

$$KCONST_t = 0.057 \times (1 - 0.005)^t \times SCONST_t$$

$$KTRANS_t = -10.03952 + 0.085402STRANS_t + [AR(1) = 0.995396]$$

$$R^2 = 0.889$$

$$D-W = 1.94$$

$$KEATING_t = KESHARE_t \times SEATING_t$$

$$KTRADE_t = -1.244721 + 0.034226STRADE_t + 0.563860KTRADE_{t-1} \\ (2.91) \quad (3.61)$$

$$R^2 = 0.978$$

$$D-W = 1.42$$

$$KFINANCE_t = KBASIC_t \times (-0.133410 + 1.112554SFINANCE_t / SBASIC_t \\ (3.48)$$

$$+ 0.012705DUM95 + [AR(1)=0.706229]) \\ (0.95) \quad (3.84)$$

$$R^2 = 0.901$$

$$D-W = 1.52$$

$$KHOTEL_t = KHSHARE_t \times SHOTEL_t$$

$$KSERVICE_t = KBASIC_t \times (-0.607825 + 1.189564SSERVICE_t / SBASIC_t \\ (3.74)$$

$$- 0.064717DUM95 + [AR(1)=0.863214]) \\ (-1.62) \quad (8.09)$$

$$R^2 = 0.933$$

$$D-W = 2.10$$

$$KSLG_t = 0.045 \times (1 + 0.001)^t \times SSLG_t$$

$$KFEDG_t = 0.013 \times (1+0.001)^t \times SFEDG_t$$

where:

KPOP_t = Kauai county population

KTPI_t = Kauai county total personal income

DUM92 = Dummy variable DUM92 = 1 if year =1992; DUM92 = 0 otherwise

KPCPI_t = Kauai county per capita personal income

KTJOBS_t = Kauai county total jobs

KSELFJOBS_t = Kauai county self employed jobs

KWSJOBS_t = Kauai county wage and salary jobs

KAG_t = Kauai county agriculture jobs

KMANUF_t = Kauai county manufacturing jobs

KCONST_t = Kauai county construction jobs

KTRANS_t = Kauai county transportation, communication, and utility jobs

KESHARE_t = Kauai county eating and drinking job share

KEATING_t = Kauai county eating and drinking jobs

KTRADE_t = Kauai county trade (excluding Eating and drinking) jobs

KFINANCE_t = Kauai county finance, insurance, and real estate jobs

KHOTEL_t = Kauai county hotel jobs

KHSHARE_t = Kauai county hotel job share

KSERVICE_t = Kauai county other services jobs

KSLG_t = Kauai county State and local government jobs

KFEDG_t = Kauai county Federal government jobs

KBASIC_t = Kauai county basic jobs

Other variables and notations are as defined in previous sections

APPENDIX F

DATA BASE FOR FINAL DEMAND SUBMODEL

Table F-1. Hawaii Final Demand and Population, 1970–1995 (final demand in millions of 1987 dollars)

Year	GSP	PCE	Invest. struct.	Invest. other	S&L gov. expend.	S&L gov. constr.	Federal civilian	Federal defense	Visitor expend.	Other exports	Imports	Disp. income	Populat. (1,000)
1970	11,193.6	6,497.2	1,643.9	678.9	1,424.6	737.7	131.8	2,485.0	1,694.8	1,995.2	6,207.3	8,386.8	771.7
1971	11,772.0	6,785.7	1,436.9	700.4	1,561.5	613.9	155.6	2,471.2	1,967.0	2,149.9	5,678.5	8,863.0	801.6
1972	12,562.0	7,185.2	1,293.3	734.6	1,666.8	640.7	167.0	2,653.1	2,290.1	2,144.3	6,315.1	9,278.9	828.3
1973	13,183.6	7,757.1	1,520.3	671.4	1,727.3	662.1	152.2	2,920.6	2,671.2	2,530.0	7,601.3	9,783.8	851.6
1974	13,143.0	7,977.2	1,603.1	681.4	1,773.9	587.9	154.4	2,844.0	2,966.0	2,232.5	7,833.4	10,248.1	868.0
1975	13,921.0	8,449.1	1,618.7	578.5	2,118.8	674.2	165.4	2,858.1	2,982.6	2,599.1	7,887.5	10,405.0	886.2
1976	14,100.8	8,838.2	1,281.9	832.3	2,084.8	707.7	182.0	2,829.5	3,347.4	2,972.9	8,820.3	10,690.3	904.2
1977	14,529.2	9,352.5	859.8	915.3	2,194.4	559.2	185.9	2,833.1	3,505.6	3,141.3	9,312.6	10,866.9	918.3
1978	14,985.0	9,861.5	1,047.1	869.6	2,168.8	444.3	202.5	2,738.8	3,728.8	3,231.5	9,546.8	11,136.5	931.5
1979	15,572.2	10,288.2	1,264.6	788.3	2,067.7	427.8	187.9	2,552.5	4,001.8	3,139.7	9,915.9	11,604.0	953.2
1980	16,434.6	10,521.1	1,496.1	737.3	2,058.4	398.3	174.1	2,500.5	4,148.8	3,039.0	9,801.0	12,179.6	968.5
1981	16,833.1	10,749.9	1,296.9	660.7	2,111.9	363.4	176.3	2,482.1	4,267.9	2,986.8	9,171.8	12,040.1	978.2
1982	16,435.2	10,430.9	959.4	541.9	2,197.7	378.1	157.0	2,742.6	4,722.9	3,224.0	9,207.7	12,358.5	993.8
1983	17,058.3	10,533.7	1,043.6	621.8	2,313.1	406.3	164.6	2,878.8	4,857.9	3,451.2	9,732.1	13,053.5	1,012.8
1984	17,571.2	10,911.6	893.6	585.8	2,301.3	381.8	161.4	2,868.8	5,371.3	3,683.6	9,609.0	13,515.9	1,027.9
1985	18,371.0	11,167.6	1,011.8	697.7	2,416.7	360.2	478.5	3,183.1	5,768.6	3,762.9	10,133.2	13,866.9	1,039.7
1986	19,281.3	11,967.6	1,284.5	818.9	2,542.1	460.6	488.1	3,082.2	6,444.5	4,021.2	10,396.6	14,651.7	1,051.8
1987	20,027.3	12,338.0	1,513.6	902.4	2,606.1	479.6	513.5	3,035.5	6,887.6	4,057.5	11,308.0	14,963.2	1,067.8
1988	21,206.1	12,879.5	1,737.9	1,085.6	2,813.8	502.8	533.3	3,118.1	8,203.5	4,207.5	13,379.6	15,640.7	1,079.8
1989	22,213.9	13,373.0	2,110.0	1,136.9	3,117.0	642.0	547.9	3,100.6	8,443.2	4,389.4	14,617.9	16,017.9	1,094.5
1990	22,976.7	13,873.0	2,314.6	1,207.4	3,028.0	798.6	556.5	3,059.1	8,249.9	4,404.9	14,915.1	17,258.6	1,112.6
1991	22,887.7	13,824.2	2,388.6	1,382.0	3,032.1	851.2	569.0	3,209.8	8,867.4	4,409.9	15,243.2	17,307.8	1,129.6
1992	23,095.1	14,050.5	2,224.6	1,385.7	3,106.7	934.7	613.1	3,184.6	7,830.4	4,424.6	15,242.8	17,773.9	1,147.8
1993	23,180.1	14,445.4	1,966.1	1,390.8	3,129.3	927.2	625.9	3,245.2	6,941.9	4,636.0	14,603.5	18,091.0	1,160.0
1994	23,190.3	14,527.8	1,736.0	1,391.4	3,084.3	834.9	626.1	3,200.3	8,178.8	4,452.5	14,841.8	18,214.3	1,172.6
1995	23,297.8	14,623.9	1,493.5	1,397.9	3,075.3	815.4	629.0	3,215.1	8,252.1	4,473.2	14,677.6	18,502.0	1,179.2

Table F-2. Exogenous Variables

Variable	1995	2000	2005	2010	2015	2020
Exports (percent share of industry output that will be exported) ¹						
Sugar cane	0.0	0.0	0.0	0.0	0.0	0.0
Pineapple	42.4	42.4	42.4	42.4	42.4	42.4
Other Agricultural exports	26.5	26.5	26.5	26.5	26.5	26.5
Sugar processing	84.8	84.8	84.8	84.8	84.8	84.8
Pineapple processing	97.8	97.8	97.8	97.8	97.8	97.8
Other food export	9.8	9.8	9.8	9.8	9.8	9.8
Misc. manufacturing	11.8	11.8	11.8	11.8	11.8	11.8
Construction	0.1	0.1	0.1	0.1	0.1	0.1
Transportation	8.5	8.5	8.5	8.5	8.5	8.5
Communication	10.2	10.2	10.2	10.2	10.2	10.2
Utilities	0.0	0.0	0.0	0.0	0.0	0.0
Wholesale trade	7.9	7.9	7.9	7.9	7.9	7.9
Eating and drinking	0.0	0.0	0.0	0.0	0.0	0.0
Retail trade	0.0	0.0	0.0	0.0	0.0	0.0
Finance	4.0	4.0	4.0	4.0	4.0	4.0
Hotels	0.0	0.0	0.0	0.0	0.0	0.0
Health & professional service	3.4	3.4	3.4	3.4	3.4	3.4
Other services	8.0	8.0	8.0	8.0	8.0	8.0
Govern. enterprises	2.4	2.4	2.4	2.4	2.4	2.4
Other industries	0.0	0.0	0.0	0.0	0.0	0.0
Visitors						
Visitor expenditures (bil. \$87)	8.347	9.998	11.572	13.085	14.491	16.047
Visitor rooms (1,000)	69.8	78.5	86.2	92.9	101.1	111.1
Hotel units	48.8	55.0	60.3	65.0	70.8	77.8
Condominium units	20.9	23.6	25.9	27.9	30.3	33.3
Statewide agricultural jobs (thousands)						
Sugar field	2.2	1.4	1.4	1.4	1.4	1.4
Pineapple field	1.3	1.0	1.0	1.0	1.0	1.0
Other agricultural	4.0	5.6	5.6	5.6	5.6	5.6
County allocation variables						
<i>Agricultural jobs (thousands)</i>						
Honolulu	2.0	2.1	2.1	2.1	2.1	2.1
Maui	1.9	2.0	2.0	2.0	2.0	2.0
Hawaii	2.6	3.0	3.0	3.0	3.0	3.0
Kauai	1.0	1.0	1.0	1.0	1.0	1.0
<i>County share of statewide industry jobs (%)</i>						
Honolulu eating & drinking	75.6	73.4	72.4	71.0	69.7	68.3
Maui eating & drinking	12.0	12.6	12.6	12.8	12.9	12.9
Hawaii eating & drinking	7.4	8.0	8.2	8.8	9.7	10.6
Kauai eating & drinking	5.0	6.0	6.8	7.4	7.7	8.2
Honolulu hotel	48.1	46.8	45.2	43.6	42.1	40.4
Maui hotel	28.9	28.8	28.9	28.7	28.5	28.5
Hawaii county hotel	14.7	15.0	15.6	16.5	17.8	19.1
Kauai hotel	8.3	10.0	10.4	11.2	11.5	12.0
Other variables						
Ratio between pop. & housing units	2.90	2.89	2.87	2.85	2.83	2.81

¹ Excludes visitor sales. Total industry outputs are shown in Appendix Table A-2

APPENDIX G

DATA BASE FOR OUTPUT SUBMODEL

Table G-1. Hawaii State Output (millions of 1987 dollars)

Industry	1987	1995
Total Output	27,336.5	32,989.8
Sugarcane	218.0	97.6
Pineapple	99.3	54.7
Other resources	270.3	182.4
Sugar processing	385.1	199.0
Pineapple processing	203.2	88.1
Other food products	771.5	625.2
Miscellaneous manufacturing	2,094.3	2,268.6
Construction	2,470.6	3,344.8
Transportation	2,138.8	2,366.5
Communication	690.0	579.5
Utilities	748.3	1,041.6
Wholesale trade	1,093.4	1,244.4
Retail trade	2,478.5	3,133.4
Eating and drinking places	1,723.9	1,927.9
Finance, insurance, and real estate	4,736.9	5,767.9
Hotels	2,060.9	2,850.2
Health and professional services	2,176.4	2,829.1
Other services	2,869.2	4,255.1
Government enterprises	107.9	133.6
Other industries (government)	NA	NA

NA = Not applicable.

Table G-2. Final Demand Coefficients¹

Industry	Personal consumption expenditures	State and local government ²	State and local government construction	Gross private investment	Federal government defense	Federal government construction	Federal government civilian	Visitor spending	Other Exports
Sugarcane	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	1.00000
Pineapple	0.00021	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00053	1.00000
Other resources	0.00274	0.00083	0.00000	0.00000	0.00000	0.00000	0.00000	0.00233	1.00000
Sugar processing	0.00169	0.00059	0.00000	0.00000	0.00036	0.00000	0.00000	0.00029	1.00000
Pine processing	0.00021	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00021	1.00000
Other food	0.02943	0.00448	0.00000	0.00000	0.00000	0.00000	0.00000	0.01141	1.00000
Misc manufacturing	0.01691	0.01859	0.00000	0.02918	0.00930	0.00000	0.00480	0.02442	1.00000
Construction	0.00000	0.22317	1.00000	1.26884	0.03608	1.00000	0.03661	0.00000	1.00000
Transportation	0.01822	0.01337	0.00000	0.00929	0.00065	0.00000	0.00000	0.16755	1.00000
Communication	0.01240	0.00735	0.00000	0.00000	0.00054	0.00000	0.00000	0.00355	1.00000
Utilities	0.02195	0.01447	0.00000	0.00000	0.00750	0.00000	0.00000	0.00006	1.00000
Wholesale	0.02801	0.01128	0.00000	0.09787	0.00036	0.00000	0.00000	0.01831	1.00000
Retail trade	0.12335	-0.00083	0.00000	0.02440	0.00000	0.00000	0.00000	0.11398	1.00000
Eating & drinking	0.05078	-0.00865	0.00000	0.00000	0.00004	0.00000	0.00000	0.14116	1.00000
Finance, Ins, Real Estate	0.25706	0.01969	0.00000	0.00000	0.00007	0.00000	0.00000	0.00072	1.00000
Hotels	0.00584	-0.00362	0.00000	0.00000	0.00007	0.00000	0.00000	0.27203	1.00000
Health & Professional serv	0.09896	0.10921	0.00000	0.00000	0.00317	0.00000	0.00060	0.00478	1.00000
Other service	0.06770	0.01627	0.00000	0.00000	0.00094	0.00000	0.00120	0.09145	1.00000
Government enterprises	0.00144	0.00134	0.00000	0.00000	0.00004	0.00000	0.00000	0.00121	1.00000
Other industry	0.00000	0.67902	0.00000	0.00000	0.96972	0.00000	0.95138	0.00000	1.00000

¹ A coefficient represents the share of the final demand components (listed across the top of the table) produced by the corresponding industry at the level of the industry.

² Negative coefficients can result when, on balance, government "sells" more services in an industry category than it buys. This can occur in the account of unusual transactions such as school lunch program subsidies and others.

Table G-3. 1987 Total Requirement Coefficients¹

Table G-3. 1987 Total Requirement Coefficients (continued)

Table G-3. 1987 Total Requirement Coefficients (continued)

	Health & professional services	Other service	Government enterprises	Other industry
Sugarcane	0.00026	0.00032	0.00003	0.00000
Pineapple	0.00000	0.00000	0.00000	0.00000
Other resources	0.00070	0.00118	0.00005	0.00000
Sugar processing	0.00047	0.00057	0.00005	0.00000
Pine processing	0.00000	0.00000	0.00000	0.00000
Other food	0.00298	0.00365	0.00017	0.00000
Misc. manufacturing	0.03053	0.05508	0.02258	0.00000
Construction	0.01064	0.02983	0.00648	0.00000
Transportation	0.01380	0.02056	0.06241	0.00000
Communication	0.02203	0.02794	0.00606	0.00000
Utilities	0.00972	0.01799	0.00632	0.00000
Wholesale	0.01057	0.02473	0.00478	0.00000
Retail trade	0.00184	0.00981	0.00167	0.00000
Eating & drinking	0.00921	0.01087	0.00088	0.00000
Finance, ins, real estate	0.06225	0.07421	0.03184	0.00000
Hotels	0.00606	0.00609	0.00031	0.00000
Health & professional serv.	1.03577	0.02425	0.00926	0.00000
Other service	0.04814	1.08289	0.02546	0.00000
Government enterprises	0.00403	0.00697	1.00046	0.00000
Other industry	0.00000	0.00000	0.00000	1.00000

The coefficients represent total output (directly and indirectly) required from the industry (left of the table in order to deliver \$1 worth of goods and services produced by the industry top of the table to final demand. The summation of a column is Type II output multiplier industry on the top of the table.

Table G-4. Output Adjustment for 1995 (millions of 1987 dollars)

Industry	Total Final Demand	Total I-O Output	Estimated output	Output adjustment
Sugarcane	0.0	134.0	97.6	-36.4
Pineapple	30.6	53.5	54.7	1.2
Other agriculture	109.8	277.2	182.4	-94.8
Sugar processing	198.7	236.8	199.0	-37.8
Pineapple processing	90.9	91.3	88.1	-3.3
Other food products	596.2	877.0	625.2	-251.8
Misc manufacturing	848.3	2,398.9	2,268.6	-130.4
Construction	2,454.5	2,973.6	3,344.8	371.3
Transportation	1,904.0	2,462.3	2,366.5	-95.8
Communication	292.6	792.3	579.5	-212.8
Utilities	386.6	874.6	1,041.6	167.0
Wholesale trade	839.4	1,304.3	1,244.4	-59.9
Retail trade	2,764.5	2,944.4	3,133.4	189.0
Eating and drinking places	1,875.1	2,017.1	1,927.9	-89.2
Finance, insurance, and real estate	4,026.2	5,652.3	5,767.9	115.7
Hotels	2,318.6	2,374.1	2,850.2	476.1
Health and professional services	1,916.5	2,613.5	2,829.1	215.6
Other services	2,129.4	3,449.4	4,255.1	805.7
Government enterprises	37.8	127.7	133.6	5.9

APPENDIX H

DATA BASE FOR EMPLOYMENT SUBMODEL

**Table H-1. Hawaii State Wage and Salary
Employment (thous.)**

	1987	1995
Wage and salary employment	470.8	540.2
Sugarcane	3.8	2.2
Pineapple	1.9	1.3
Other resources	4.9	4.1
Sugar processing	3.1	1.6
Pineapple processing	2.1	0.9
Other food products	4.9	3.9
Miscellaneous manufacturing	12.0	10.6
Construction	21.2	26.4
Transportation	26.9	30.7
Communication	7.3	6.3
Utilities	2.7	3.8
Wholesale trade	20.4	21.5
Retail trade	59.6	67.3
Eating and drinking places	43.8	46.9
Finance, insurance, and real estate	33.7	37.1
Hotels	31.3	37.9
Health and professional services	37.1	51.5
Other services	58.0	75.4
Government enterprises	2.4	2.8
Other industries (government)	93.7	108.3
Military	58.1	52.8

**Table H-2. Hawaii State Output-Job Ratio
(\$ output/job)**

	1987	1995
Wage and salary employment	58.1	61.1
Sugarcane	57.4	44.4
Pineapple	52.3	42.1
Other resources	55.2	44.7
Sugar processing	124.2	124.4
Pineapple processing	96.8	97.8
Other food products	157.4	160.3
Miscellaneous manufacturing	174.5	215.0
Construction	116.5	126.7
Transportation	79.5	77.1
Communication	94.5	92.7
Utilities	277.1	277.8
Wholesale trade	53.6	57.9
Retail trade	41.6	46.6
Eating and drinking places	39.4	41.1
Finance, insurance, and real estate	140.6	155.5
Hotels	65.9	75.2
Health and professional services	58.7	54.9
Other services	49.5	56.4
Government enterprises	45.0	47.7
Other industries (government)	na	na
Military	na	na

na= not applicable.

APPENDIX I

DATA BASE FOR INCOME SUBMODEL

Table I-1. Hawaii State Personal Income

(in millions of 1987 constant dollars)

Year	Personal income	Labor income	Transfer payment	Dividends int., rents	Contrib. to soc. ins.	Per capita income (\$)	Tax/nontax	Disposable income
1970	9,821.0	8,082.6	710.1	1,392.4	364.1	12,873.7	1,434.2	8,386.8
1971	10,214.9	8,261.8	876.9	1,470.5	394.3	12,905.5	1,351.9	8,863.0
1972	10,847.4	8,764.5	1,009.9	1,490.7	417.7	13,259.6	1,568.5	9,278.9
1973	11,403.8	9,159.7	1,100.9	1,615.4	472.2	13,546.7	1,619.9	9,783.8
1974	11,882.6	9,519.5	1,206.8	1,650.0	493.6	13,846.5	1,634.6	10,248.1
1975	11,791.3	9,304.6	1,426.2	1,565.6	505.1	13,475.1	1,386.3	10,405.0
1976	12,212.8	9,567.8	1,594.0	1,573.2	522.1	13,686.1	1,522.5	10,690.3
1977	12,499.2	9,812.8	1,614.3	1,611.0	538.8	13,650.0	1,632.3	10,866.9
1978	12,890.8	10,065.5	1,631.6	1,759.3	565.6	13,878.2	1,754.4	11,136.5
1979	13,470.8	10,453.9	1,661.7	1,951.6	596.4	14,178.5	1,866.8	11,604.0
1980	14,113.2	10,890.5	1,750.3	2,079.4	607.0	14,577.2	1,933.6	12,179.6
1981	13,972.8	10,446.0	1,877.0	2,285.1	635.3	14,284.3	1,932.6	12,040.1
1982	14,047.6	10,549.5	1,955.2	2,204.6	661.7	14,135.8	1,689.1	12,358.5
1983	14,872.5	11,078.9	2,080.0	2,393.2	679.6	14,684.7	1,819.0	13,053.5
1984	15,272.7	11,270.1	2,084.8	2,619.9	702.2	14,856.7	1,756.8	13,515.9
1985	15,827.6	11,691.8	2,157.3	2,715.0	736.6	15,222.1	1,960.7	13,866.9
1986	16,725.0	12,353.2	2,273.1	2,865.8	767.2	15,900.3	2,073.2	14,651.7
1987	17,335.9	13,033.8	2,264.1	2,838.0	800.0	16,231.0	2,372.7	14,963.2
1988	18,176.8	13,803.1	2,291.3	2,947.4	865.0	16,830.5	2,536.1	15,640.7
1989	18,928.3	14,319.9	2,368.2	3,167.7	927.5	17,292.3	2,910.3	16,017.9
1990	20,291.5	15,242.0	2,678.7	3,348.6	977.8	18,233.3	3,032.9	17,258.6
1991	20,223.6	15,301.1	2,612.9	3,303.8	994.2	17,836.6	2,915.9	17,307.8
1992	20,635.8	15,815.0	2,856.6	2,981.8	1,017.7	17,896.5	2,861.9	17,773.9
1993	20,964.4	15,761.6	3,030.7	3,180.1	1,008.0	17,987.0	2,873.4	18,091.0
1994	21,028.1	15,581.0	3,188.8	3,272.7	1,014.4	17,842.5	2,813.9	18,214.3
1995	21,255.7	15,388.4	3,475.1	3,397.1	1,004.9	17,909.7	2,753.7	18,502.0

Note: All the personal income components are deflated with the deflator for personal consumption expenditures.

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Table I-2. Hawaii State Labor Income

(millions of 1987 dollars)	1987	1995
Personal consumption deflator (87=	1,000	1,373
Labor income	13,033.8	15,388.4
Sugarcane	81.3	36.4
Pineapple	42.3	23.3
Other resources	103.5	69.8
Sugar processing	68.9	35.6
Pineapple processing	43.7	18.9
Other food products	102.4	83.0
Miscellaneous manufacturing	409.3	443.4
Construction	914.1	1,237.5
Transportation	749.3	829.1
Communication	291.8	245.1
Utilities	125.9	175.2
Wholesale trade	513.7	584.7
Retail trade	1,070.0	1,352.7
Eating and drinking places	518.5	579.9
Finance, insurance, and real estate	951.5	1,158.6
Hotels	652.4	902.2
Health and professional services	1,479.3	1,922.9
Other services	1,230.5	1,824.9
Government enterprises	94.0	116.4
Other industries (government)	2,281.8	2,650.6
Military	1,309.6	1,098.1
State and local government	1,383.8	1,879.8
Federal civilian	982.0	770.8

Table I-3. Hawaii State Income-Job Ratio

(thousands of 1987dollars per job)	1987	1995
Sugarcane	21.4	16.6
Pineapple	22.3	17.9
Other resources	21.1	17.1
Sugar processing	22.2	22.3
Pineapple processing	20.8	21.0
Other food products	20.9	21.3
Miscellaneous manufacturing	34.1	42.0
Construction	43.1	46.9
Transportation	27.9	27.0
Communication	40.0	39.2
Utilities	46.6	46.7
Wholesale trade	25.2	27.2
Retail trade	18.0	20.1
Eating and drinking places	11.8	12.4
Finance, insurance, and real estate	28.2	31.2
Hotels	20.9	23.8
Health and professional services	39.9	37.3
Other services	21.2	24.2
Government enterprises	39.2	41.6
Other industries (government)	24.4	24.5
Military	22.5	20.8

Table I-4. Income-Job Ratio and Income Increasing Factor

	Labor income per worker (\$87)		Average annual growth rate (%)	Income increasing factor for 1995-2000
	1970	1995		
Agriculture	28,379	17,097	(2.0)	0.000
Food processing	19,427	21,488	0.4	0.004
Misc. manufacturing	21,976	42,024	2.6	0.026
Construction	33,083	46,876	1.4	0.014
Transportation	24,887	27,006	0.3	0.003
Communication	29,150	39,209	1.2	0.012
Utilities	31,033	46,729	1.7	0.017
Wholesale trade	23,260	27,195	0.6	0.006
Retail trade	15,965	20,122	0.9	0.009
Eating and drinking	12,385	12,359	(0.0)	0.000
Finance, insurance, real estate	25,977	31,230	0.7	0.007
Hotels	18,998	23,806	0.9	0.009
Other services	22,952	29,534	1.0	0.010
Federal government	25,556	28,899	0.5	0.005
State & local government	21,937	23,380	0.3	0.003

APPENDIX J

DATA BASE FOR POPULATION SUBMODEL

Table J-1. Estimation of 1995 Population

Age	Resident Population		Military Personnel		Military Dependents		Other Civilian Population	
	Male	Female	Male	Female	Male	Female	Male	Female
0	9,893	9,419	0	0	2,130	1,670	7,763	7,749
1	9,833	9,257	0	0	1,666	1,392	8,168	7,865
2	9,682	9,132	0	0	1,405	1,121	8,278	8,011
3	9,671	9,175	0	0	1,185	1,310	8,486	7,865
4	9,846	9,285	0	0	1,044	1,250	8,803	8,035
5	9,643	8,998	0	0	1,086	1,290	8,556	7,708
6	8,928	8,392	0	0	1,144	972	7,784	7,420
7	8,539	8,094	0	0	827	947	7,712	7,146
8	7,975	7,676	0	0	1,008	860	6,967	6,816
9	8,503	7,969	0	0	1,029	611	7,474	7,357
10	8,558	8,026	0	0	786	689	7,772	7,337
11	8,349	7,731	0	0	678	472	7,671	7,259
12	8,497	7,848	0	0	710	432	7,787	7,416
13	8,365	7,966	0	0	498	664	7,867	7,302
14	8,190	7,762	0	0	474	434	7,716	7,328
15	8,212	7,569	0	0	425	420	7,787	7,149
16	7,767	7,307	0	0	290	457	7,477	6,850
17	7,824	7,395	0	0	383	287	7,441	7,108
18	7,954	7,728	595	17	421	274	6,938	7,438
19	8,799	8,206	1,870	338	165	532	6,765	7,336
20	9,595	8,046	3,439	449	111	589	6,045	7,008
21	9,587	7,517	3,764	439	121	852	5,701	6,227
22	9,281	7,420	3,035	255	211	1,026	6,035	6,140
23	8,494	6,734	2,399	444	141	907	5,954	5,383
24	8,390	6,976	2,177	407	155	1,016	6,058	5,553
25	8,412	7,214	2,431	581	216	1,281	5,765	5,353
26	8,380	7,387	2,458	361	124	1,201	5,798	5,825
27	8,435	7,654	2,319	266	100	1,256	6,016	6,132
28	8,239	7,566	1,985	329	61	1,031	6,192	6,206
29	9,356	8,611	1,983	369	130	1,142	7,242	7,100
30	9,545	9,034	1,615	283	214	1,040	7,716	7,711
31	9,697	9,036	1,428	188	74	945	8,195	7,903
32	9,785	9,178	1,397	279	63	937	8,325	7,962
33	9,729	9,273	1,358	220	79	831	8,291	8,223
34	10,301	9,782	987	125	143	717	9,171	8,939
35	10,447	9,804	1,219	241	78	657	9,150	8,906
36	10,186	9,670	1,121	91	52	814	9,014	8,765
37	10,316	9,822	1,120	54	20	664	9,176	9,104
38	9,848	9,436	954	95	18	372	8,877	8,969
39	10,909	10,364	712	102	102	552	10,094	9,710
40	10,655	9,958	813	0	53	424	9,790	9,533
41	9,924	9,674	628	27	28	307	9,269	9,340
42	9,698	9,378	632	27	27	391	9,039	8,960
43	9,260	9,063	489	45	45	334	8,725	8,684
44	9,435	9,093	183	19	64	259	9,188	8,815
45	9,028	8,943	323	9	20	214	8,685	8,720

Table J-1. Estimation of 1995 Population (continued)

Age	Resident Population		Military Personnel		Military Dependents		Other Civilian Population	
	Male	Female	Male	Female	Male	Female	Male	Female
46	8,371	8,269	225	0	9	145	8,137	8,123
47	8,189	8,108	139	15	14	155	8,036	7,938
48	8,355	8,097	149	25	6	133	8,199	7,939
49	6,832	6,855	121	12	6	121	6,704	6,721
50	7,028	6,966	89	17	7	124	6,931	6,825
51	6,422	6,495	147	0	19	72	6,256	6,423
52	6,272	6,494	55	0	47	45	6,170	6,449
53	5,314	5,682	23	0	12	28	5,280	5,655
54	5,096	5,690	74	0	28	94	4,994	5,596
55	4,802	5,312	16	8	0	7	4,786	5,297
56	4,658	5,262	0	8	16	48	4,642	5,205
57	4,496	5,238	60	0	0	43	4,436	5,195
58	3,912	4,554	0	0	0	56	3,912	4,497
59	4,205	4,901	0	8	21	11	4,183	4,882
60	4,235	4,877	23	8	23	55	4,189	4,814
61	4,031	4,496	13	0	4	0	4,013	4,496
62	4,051	4,733	0	0	15	39	4,036	4,694
63	4,194	4,703	0	0	22	15	4,172	4,687
64	4,696	5,089	0	0	17	35	4,679	5,054
65	4,602	5,428	0	0	0	31	4,602	5,397
66	4,304	5,175	0	0	55	40	4,249	5,134
67	4,443	5,431	0	0	8	11	4,435	5,420
68	4,032	4,769	0	0	10	30	4,022	4,739
69	4,391	5,086	0	0	7	0	4,384	5,086
70	4,329	4,974	0	0	0	17	4,329	4,957
71	4,127	4,550	0	0	0	0	4,127	4,550
72	3,928	4,455	0	0	0	0	3,928	4,455
73	3,715	4,000	0	0	7	29	3,708	3,972
74	3,599	3,726	0	0	18	48	3,581	3,678
75	3,073	3,718	0	0	0	20	3,073	3,698
76	2,801	3,393	0	0	10	0	2,791	3,393
77	2,711	3,126	0	0	0	0	2,711	3,126
78	2,546	2,820	0	0	8	26	2,538	2,794
79	2,398	2,520	0	0	0	0	2,398	2,520
80	2,041	2,210	0	0	20	0	2,020	2,210
81	1,809	1,984	0	0	0	0	1,809	1,984
82	1,531	1,850	0	0	0	0	1,531	1,850
83	1,419	1,632	0	0	0	0	1,419	1,632
84	1,197	1,527	0	0	10	14	1,187	1,513
85	5,695	7,628	0	0	0	0	5,695	7,628
Total	595,809	583,389	44,569	6,160	20,225	37,338	531,016	539,890

Note: Military personnel and their dependents are calculated based on 1990 distribution published by the Census Bureau.

Source: Bureau of the Census.

Table J-2. Hawaii Life Table for Males, 1990

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
0	9,609	83.0000	0.008461	100,000	846	99,499	7,552,159	75.52	0.996428
1	8,888	6.0000	0.000204	99,154	20	99,144	7,452,660	75.16	0.999724
2	8,604	3.0000	0.000349	99,134	35	99,116	7,353,516	74.18	0.999469
3	8,405	6.0000	0.000714	99,099	71	99,064	7,254,400	73.20	0.999465
4	8,409	3.0000	0.000357	99,028	35	99,011	7,155,336	72.26	0.999762
5	8,408	1.0000	0.000119	98,993	12	98,987	7,056,325	71.28	0.999821
6	8,357	2.0000	0.000239	98,981	24	98,970	6,957,338	70.29	0.999781
7	8,408	1.6667	0.000198	98,958	20	98,948	6,858,368	69.31	0.999774
8	7,875	2.0000	0.000254	98,938	25	98,925	6,759,420	68.32	0.999755
9	8,438	2.0000	0.000237	98,913	23	98,901	6,660,495	67.34	0.999758
10	8,081	2.0000	0.000247	98,889	24	98,877	6,561,594	66.35	0.999812
11	7,744	1.0000	0.000129	98,865	13	98,859	6,462,716	65.37	0.999782
12	7,611	2.3333	0.000307	98,852	30	98,837	6,363,858	64.38	0.999757
13	7,420	1.3333	0.000180	98,822	18	98,813	6,265,021	63.40	0.999770
14	7,132	2.0000	0.000280	98,804	28	98,790	6,166,208	62.41	0.999563
15	7,302	4.3333	0.000593	98,776	59	98,747	6,067,417	61.43	0.999422
16	7,110	4.0000	0.000562	98,718	56	98,690	5,968,670	60.46	0.999426
17	7,391	4.3333	0.000586	98,662	58	98,633	5,869,980	59.50	0.999084
18	6,683	8.3333	0.001246	98,605	123	98,543	5,771,347	58.53	0.998758
19	7,269	9.0000	0.001237	98,482	122	98,421	5,672,803	57.60	0.998567
20	6,542	10.6667	0.001629	98,360	160	98,280	5,574,383	56.67	0.998438
21	6,461	9.6667	0.001495	98,200	147	98,126	5,476,103	55.77	0.998500
22	6,863	10.3333	0.001505	98,053	148	97,979	5,377,977	54.85	0.998512
23	7,474	11.0000	0.001471	97,905	144	97,833	5,279,998	53.93	0.998622
24	8,030	10.3333	0.001286	97,761	126	97,698	5,182,165	53.01	0.998550
25	8,048	13.0000	0.001614	97,636	158	97,557	5,084,466	52.08	0.998575
26	8,088	10.0000	0.001236	97,478	120	97,418	4,986,910	51.16	0.998436

Table J-2. Hawaii Life Table for Males, 1990 (continued)

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
27	8,094	15.3333	0.001893	97,357	184	97,265	4,889,492	50.22	0.998097
28	7,829	15.0000	0.001914	97,173	186	97,080	4,792,226	49.32	0.998146
29	8,907	16.0000	0.001795	96,987	174	96,900	4,695,146	48.41	0.998226
30	8,735	15.3333	0.001754	96,813	170	96,728	4,598,246	47.50	0.998131
31	8,730	17.3333	0.001984	96,643	192	96,548	4,501,518	46.58	0.997874
32	8,656	19.6667	0.002269	96,452	219	96,342	4,404,970	45.67	0.997771
33	8,520	18.6667	0.002189	96,233	211	96,127	4,308,628	44.77	0.997972
34	9,452	17.6667	0.001867	96,022	179	95,933	4,212,501	43.87	0.998066
35	8,987	18.0000	0.002001	95,843	192	95,747	4,116,568	42.95	0.997914
36	8,589	18.6667	0.002171	95,651	208	95,547	4,020,821	42.04	0.997594
37	8,569	22.6667	0.002642	95,443	252	95,317	3,925,274	41.13	0.997587
38	7,926	17.3333	0.002185	95,191	208	95,087	3,829,956	40.23	0.997837
39	9,021	19.3333	0.002141	94,983	203	94,882	3,734,869	39.32	0.997777
40	8,521	19.6667	0.002305	94,780	219	94,671	3,639,987	38.40	0.997598
41	7,991	20.0000	0.002500	94,562	236	94,443	3,545,317	37.49	0.997264
42	7,951	23.6667	0.002972	94,325	280	94,185	3,450,873	36.58	0.997001
43	7,920	24.0000	0.003026	94,045	285	93,903	3,356,688	35.69	0.996329
44	6,854	29.6667	0.004319	93,760	405	93,558	3,262,786	34.80	0.996418
45	6,677	19.0000	0.002842	93,355	265	93,223	3,169,228	33.95	0.996663
46	6,334	24.3333	0.003834	93,090	357	92,912	3,076,006	33.04	0.996416
47	6,189	20.6667	0.003334	92,733	309	92,578	2,983,094	32.17	0.995883
48	5,154	25.3333	0.004903	92,424	453	92,197	2,890,516	31.27	0.995326
49	5,390	24.0000	0.004443	91,971	409	91,766	2,798,318	30.43	0.994595
50	5,058	32.3333	0.006372	91,562	583	91,270	2,706,552	29.56	0.994285
51	4,606	23.3333	0.005053	90,979	460	90,749	2,615,281	28.75	0.994421
52	4,461	27.3333	0.006108	90,519	553	90,243	2,524,532	27.89	0.993971
53	4,134	24.6667	0.005949	89,966	535	89,698	2,434,290	27.06	0.993581

Table J-2. Hawaii Life Table for Males, 1990 (continued)

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
54	4,194	29.0000	0.006891	89,431	616	89,123	2,344,592	26.22	0.993219
55	4,233	28.3333	0.006671	88,815	592	88,518	2,255,469	25.40	0.991924
56	4,055	38.6667	0.009490	88,222	837	87,803	2,166,951	24.56	0.991385
57	4,123	32.0000	0.007731	87,385	676	87,047	2,079,147	23.79	0.990300
58	3,971	46.6667	0.011683	86,709	1,013	86,203	1,992,100	22.97	0.989345
59	4,520	43.6667	0.009614	85,696	824	85,284	1,905,897	22.24	0.989217
60	4,459	53.6667	0.011964	84,872	1,015	84,365	1,820,613	21.45	0.986530
61	4,523	68.3333	0.014995	83,857	1,257	83,228	1,736,248	20.70	0.985982
62	4,576	60.0000	0.013026	82,599	1,076	82,061	1,653,020	20.01	0.987216
63	4,491	56.6667	0.012539	81,524	1,022	81,012	1,570,959	19.27	0.986424
64	4,638	68.3333	0.014626	80,501	1,177	79,913	1,489,946	18.51	0.984111
65	4,715	81.6667	0.017172	79,324	1,362	78,643	1,410,034	17.78	0.982380
66	4,404	80.3333	0.018076	77,962	1,409	77,257	1,331,391	17.08	0.981349
67	4,376	85.0000	0.019237	76,553	1,473	75,816	1,254,134	16.38	0.979495
68	4,235	93.3333	0.021798	75,080	1,637	74,262	1,178,318	15.69	0.977176
69	3,987	96.3333	0.023873	73,443	1,753	72,567	1,104,056	15.03	0.974838
70	3,602	96.6667	0.026482	71,690	1,898	70,741	1,031,489	14.39	0.973393
71	3,309	89.6667	0.026736	69,791	1,866	68,858	960,749	13.77	0.969304
72	3,062	108.3333	0.034765	67,926	2,361	66,745	891,890	13.13	0.965138
73	2,857	101.6667	0.034963	65,564	2,292	64,418	825,145	12.59	0.965085
74	2,743	97.3333	0.034866	63,272	2,206	62,169	760,727	12.02	0.965685
75	2,593	89.0000	0.033744	61,066	2,061	60,035	698,559	11.44	0.962337
76	2,347	100.0000	0.041719	59,005	2,462	57,774	638,523	10.82	0.956340
77	2,310	108.0000	0.045685	56,544	2,583	55,252	580,749	10.27	0.951355
78	2,077	110.3333	0.051747	53,960	2,792	52,564	525,497	9.74	0.942850
79	1,911	124.0000	0.062848	51,168	3,216	49,560	472,933	9.24	0.940075
80	1,642	96.0000	0.056805	47,952	2,724	46,590	423,373	8.83	0.939019

Table J-2. Hawaii Life Table for Males, 1990 (continued)

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
81	1,469	99.3333	0.065408	45,228	2,958	43,749	376,782	8.33	0.927363
82	1,238	103.6667	0.080372	42,270	3,397	40,571	333,033	7.88	0.922183
83	1,133	88.3333	0.075039	38,873	2,917	37,414	292,462	7.52	0.921476
84	971	83.3333	0.082291	35,956	2,959	34,476	255,048	7.09	0.912674
85	822	85.6667	0.092813	32,997	3,063	31,466	220,571	6.68	0.903515

Note: Single year civilian population by age and sex are calculated based on the revised Modified Age Race Sex (MARS) tabulations of

April 1, 1990 population released by the U.S. Bureau of the Census in Sept. 1994.

Death data are from Hawaii State Department of Health.

Table J-3. Hawaii Life Table for Females, 1990

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
0	9,163	59.0000	0.006418	100,000	642	99,631	8,167,376	81.67	0.997173
1	8,362	4.6667	0.006422	99,358	638	99,350	8,067,745	81.20	0.999753
2	8,139	2.6667	0.000328	99,341	33	99,325	7,968,395	80.21	0.999752
3	7,954	1.3333	0.000168	99,309	17	99,300	7,869,070	79.24	0.999895
4	7,915	0.3333	0.000042	99,292	4	99,290	7,769,770	78.25	0.999937
5	7,859	0.6667	0.000085	99,288	8	99,284	7,670,480	77.25	0.999894
6	7,859	1.0000	0.000127	99,280	13	99,273	7,571,196	76.26	0.999832
7	7,974	1.6667	0.000209	99,267	21	99,257	7,471,923	75.27	0.999786
8	7,584	1.6667	0.000220	99,246	22	99,235	7,372,666	74.29	0.999869
9	7,918	0.3333	0.000042	99,224	4	99,222	7,273,431	73.30	0.999957
10	7,582	0.3333	0.000044	99,220	4	99,218	7,174,209	72.31	0.999908
11	7,169	1.0000	0.000139	99,216	14	99,209	7,074,991	71.31	0.999812
12	7,025	1.6667	0.000237	99,202	24	99,190	6,975,782	70.32	0.999716
13	7,056	2.3333	0.000331	99,178	33	99,162	6,876,592	69.34	0.999736
14	6,750	1.3333	0.000198	99,146	20	99,136	6,777,430	68.36	0.999703
15	6,711	2.6667	0.000397	99,126	39	99,106	6,678,294	67.37	0.999627
16	6,686	2.3333	0.000349	99,087	35	99,069	6,579,187	66.40	0.999730
17	6,946	1.3333	0.000192	99,052	19	99,043	6,480,118	65.42	0.999677
18	6,607	3.0000	0.000454	99,033	45	99,011	6,381,075	64.43	0.999614
19	7,344	2.3333	0.000318	98,988	31	98,972	6,282,065	63.46	0.999434
20	7,372	6.0000	0.000814	98,957	81	98,916	6,183,092	62.48	0.999410
21	7,292	2.6667	0.000366	98,876	36	98,858	6,084,176	61.53	0.999619
22	7,568	3.0000	0.000396	98,840	39	98,820	5,985,318	60.56	0.999563
23	7,689	3.6667	0.000477	98,801	47	98,777	5,886,497	59.58	0.999507
24	8,511	4.3333	0.000509	98,754	50	98,729	5,787,720	58.61	0.999593
25	8,737	2.6667	0.000305	98,703	30	98,688	5,688,991	57.64	0.999701
26	9,082	2.6667	0.000294	98,673	29	98,659	5,590,303	56.65	0.999692

Table J-3. Hawaii Life Table for Females, 1990 (continued)

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
27	9,296	3.0000	0.000323	98,644	32	98,628	5,491,644	55.67	0.999514
28	8,711	5.6667	0.000650	98,613	64	98,580	5,393,016	54.69	0.999383
29	9,719	5.6667	0.000583	98,548	57	98,520	5,294,435	53.72	0.999466
30	9,633	4.6667	0.000484	98,491	48	98,467	5,195,916	52.76	0.999442
31	9,494	6.0000	0.000632	98,443	62	98,412	5,097,448	51.78	0.999399
32	9,348	5.3333	0.000570	98,381	56	98,353	4,999,036	50.81	0.999240
33	9,465	9.0000	0.000950	98,325	93	98,278	4,900,683	49.84	0.999311
34	10,119	4.3333	0.000428	98,232	42	98,211	4,802,405	48.89	0.999456
35	9,602	6.3333	0.000659	98,189	65	98,157	4,704,194	47.91	0.999331
36	9,343	6.3333	0.000678	98,125	66	98,091	4,606,037	46.94	0.999235
37	9,374	8.0000	0.000853	98,058	84	98,016	4,507,946	45.97	0.999162
38	8,499	7.0000	0.000823	97,975	81	97,934	4,409,929	45.01	0.999169
39	9,138	7.6667	0.000839	97,894	82	97,853	4,311,995	44.05	0.998951
40	8,728	11.0000	0.001260	97,812	123	97,750	4,214,142	43.08	0.998788
41	8,296	9.6667	0.001165	97,689	114	97,632	4,116,392	42.14	0.998644
42	8,181	12.6667	0.001547	97,575	151	97,499	4,018,760	41.19	0.998395
43	8,007	13.3333	0.001664	97,424	162	97,343	3,921,261	40.25	0.998353
44	6,741	11.0000	0.001630	97,262	159	97,183	3,823,918	39.32	0.998198
45	6,917	13.6667	0.001974	97,103	192	97,007	3,726,736	38.38	0.997850
46	6,441	15.0000	0.002326	96,912	225	96,799	3,629,728	37.45	0.997789
47	6,198	13.0000	0.002095	96,686	203	96,585	3,532,929	36.54	0.997561
48	5,142	14.3333	0.002784	96,484	269	96,349	3,436,344	35.62	0.996819
49	5,483	19.6667	0.003580	96,215	344	96,043	3,339,995	34.71	0.996761
50	5,058	14.6667	0.002895	95,870	278	95,732	3,243,952	33.84	0.996954
51	4,788	15.3333	0.003197	95,593	306	95,440	3,148,221	32.93	0.996766
52	4,679	15.3333	0.003272	95,287	312	95,131	3,052,781	32.04	0.996642
53	4,444	15.3333	0.003444	94,976	327	94,812	2,957,649	31.14	0.996122

Table J-3. Hawaii Life Table for Females, 1990 (continued)

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
54	4,782	20.6667	0.004312	94,648	408	94,444	2,862,837	30.25	0.995788
55	4,693	19.3333	0.004111	94,240	387	94,046	2,768,393	29.38	0.995477
56	4,581	22.6667	0.004936	93,853	463	93,621	2,674,347	28.50	0.994530
57	4,924	29.6667	0.006007	93,390	561	93,109	2,580,725	27.63	0.993377
58	4,677	34.0000	0.007243	92,829	672	92,492	2,487,616	26.80	0.993385
59	5,333	32.0000	0.005982	92,156	551	91,881	2,395,124	25.99	0.993889
60	5,166	32.3333	0.006239	91,605	572	91,319	2,303,243	25.14	0.993892
61	5,172	31.0000	0.005976	91,033	544	90,761	2,211,924	24.30	0.993190
62	5,426	41.6667	0.007650	90,489	692	90,143	2,121,163	23.44	0.992203
63	5,182	41.3333	0.007945	89,797	713	89,440	2,031,020	22.62	0.991389
64	5,183	48.3333	0.009282	89,084	827	88,670	1,941,580	21.80	0.990998
65	5,215	45.6667	0.008719	88,257	769	87,872	1,852,909	20.99	0.990110
66	4,910	54.6667	0.011072	87,487	969	87,003	1,765,037	20.17	0.988359
67	4,773	58.6667	0.012216	86,519	1,057	85,990	1,678,034	19.40	0.987807
68	4,383	53.6667	0.012170	85,462	1,040	84,942	1,592,044	18.63	0.986633
69	4,267	62.6667	0.014579	84,422	1,231	83,806	1,507,102	17.85	0.986854
70	3,883	45.6667	0.011692	83,191	973	82,705	1,423,296	17.11	0.986354
71	3,641	57.3333	0.015624	82,218	1,285	81,576	1,340,592	16.31	0.983872
72	3,516	59.0000	0.016641	80,934	1,347	80,260	1,259,016	15.56	0.981959
73	3,188	62.6667	0.019466	79,587	1,549	78,812	1,178,755	14.81	0.978869
74	2,988	69.0000	0.022829	78,038	1,782	77,147	1,099,943	14.10	0.975792
75	2,723	70.6667	0.025619	76,256	1,954	75,279	1,022,796	13.41	0.973391
76	2,487	69.6667	0.027625	74,302	2,053	73,276	947,517	12.75	0.971458
77	2,328	69.6667	0.029484	72,250	2,130	71,185	874,241	12.10	0.969782
78	2,013	63.3333	0.030975	70,120	2,172	69,034	803,056	11.45	0.965779
79	1,802	69.0000	0.037571	67,948	2,553	66,671	734,022	10.80	0.961258
80	1,586	64.6667	0.039959	65,395	2,613	64,088	667,351	10.20	0.958894

Table J-3. Hawaii Life Table for Females, 1990 (continued)

Age	Civilian Pop. Incl. Mil. Dep.	Average Deaths 1989-91	Proportion Dying (nqx)	Living at Start of Age Interval (1x)	Dying During Age Interval (ndx)	In the Age Interval (Lx)	In this & all Subsequent Intervals (Tx)	Average Remaining Lifetime	Survival Rates [L(x+1)/Lx]
81	1,427	61.6667	0.042300	62,782	2,656	61,454	603,263	9.61	0.953689
82	1,319	68.3333	0.050499	60,126	3,036	58,608	541,809	9.01	0.943779
83	1,157	74.3333	0.062247	57,090	3,554	55,313	483,201	8.46	0.936179
84	1,078	73.0000	0.065500	53,536	3,507	51,783	427,888	7.99	0.931572
85	1,019	71.0000	0.0715605	50,029	3,580	48,239	376,106	7.52	0.924751

Note: Single year civilian population by age and sex are calculated based on the revised Modified Age Race Sex (MARS) tabulations of

April 1, 1990 population released by the U.S. Bureau of the Census in Sept. 1994.

Death data are from Hawaii State Department of Health.

Table J-4. 1990 and 1995 Survival Rates for Hawaii

Age	Hawaii 1990 ¹		Survival Improving Factor ²				Hawaii 1995	
	Male Survival Rates (Lx+1)/Lx	Female Survival Rates (Lx+1)/Lx	Male 1990-2000	Male 2000-2050	Female 1990-2000	Female 2000-2050	Male Survival Rate	Female Survival Rate
Under 1	0.9964	0.9972	1.00008202	1.00004496	1.00005595	1.00003081	0.99544380	0.99655681
1	0.9997	0.9998	1.00001431	1.00000704	1.00000520	1.00000286	0.99979552	0.99977900
2	0.9995	0.9998	1.00001000	1.00000492	1.00000360	1.00000200	0.99951892	0.99977038
3	0.9995	0.9999	1.00000790	1.00000390	1.00000290	1.00000156	0.99950428	0.99990963
4	0.9998	0.9999	1.00000650	1.00000320	1.00000270	1.00000154	0.99979467	0.99995003
5	0.9998	0.9999	1.00000510	1.00000266	1.00000300	1.00000176	0.99984640	0.99990897
6	0.9998	0.9998	1.00000420	1.00000224	1.00000310	1.00000186	0.99980225	0.99984739
7	0.9998	0.9998	1.00000340	1.00000196	1.00000310	1.00000188	0.99979093	0.99980114
8	0.9998	0.9999	1.00000300	1.00000178	1.00000290	1.00000182	0.99976953	0.99988357
9	0.9998	1.0000	1.00000270	1.00000170	1.00000260	1.00000172	0.99977127	0.99996997
10	0.9998	0.9999	1.00000270	1.00000172	1.00000220	1.00000158	0.99982520	0.99991928
11	0.9998	0.9998	1.00000280	1.00000184	1.00000190	1.00000144	0.99979618	0.99982115
12	0.9998	0.9997	1.00000310	1.00000202	1.00000190	1.00000130	0.99977239	0.99972558
13	0.9998	0.9997	1.00000330	1.00000230	1.00000180	1.00000124	0.99978647	0.99974492
14	0.9996	0.9997	1.00000380	1.00000258	1.00000190	1.00000116	0.99958219	0.99971211
15	0.9994	0.9996	1.00000420	1.00000288	1.00000200	1.00000106	0.99944315	0.99963689
16	0.9994	0.9997	1.00000470	1.00000328	1.00000190	1.00000104	0.99944923	0.99973905
17	0.9991	0.9997	1.00000520	1.00000394	1.00000200	1.00000114	0.99910994	0.99968706
18	0.9988	0.9996	1.00000570	1.00000484	1.00000210	1.00000138	0.99878671	0.99962467
19	0.9986	0.9994	1.00000610	1.00000578	1.00000210	1.00000172	0.99859733	0.99944492
20	0.9984	0.9994	1.00000630	1.00000662	1.00000210	1.00000206	0.99846932	0.99942081
21	0.9985	0.9996	1.00000640	1.00000716	1.00000210	1.00000230	0.99853220	0.99962952
22	0.9985	0.9996	1.00000620	1.00000740	1.00000210	1.00000236	0.99854336	0.99957396
23	0.9986	0.9995	1.00000550	1.00000726	1.00000180	1.00000230	0.99864907	0.99951612
24	0.9986	0.9996	1.00000480	1.00000696	1.00000150	1.00000214	0.99857408	0.99960038
25	0.9986	0.9997	1.00000390	1.00000664	1.00000120	1.00000200	0.99859452	0.99970663
26	0.9984	0.9997	1.00000250	1.00000570	1.00000100	1.00000192	0.99844857	0.99969688
27	0.9981	0.9995	0.99999960	1.00000364	1.00000090	1.00000192	0.99809464	0.99951804
28	0.9981	0.9994	0.99999550	1.00000050	1.00000070	1.00000206	0.99812304	0.99938689
29	0.9982	0.9995	0.99999069	0.999999686	1.00000070	1.00000224	0.99817923	0.99946988

Table J-4. 1990 and 1995 Survival Rates for Hawaii (continued)

Age	Hawaii 1990 ¹		Survival Improving Factor ²				Hawaii 1995	
	Male Survival Rates (Lx+1)/Lx	Female Survival Rates (Lx+1)/Lx	Male 1990-2000	Male 2000-2050	Female 1990-2000	Female 2000-2050	Male Survival Rate	Female Survival Rate
30	0.9981	0.9994	0.99998599	0.99999331	1.0000060	1.00000246	0.99806148	0.99944496
31	0.9979	0.9994	0.99998208	0.99999033	1.0000070	1.00000266	0.99778425	0.99940242
32	0.9978	0.9992	0.99997968	0.99998818	1.00000100	1.00000290	0.99766958	0.99924466
33	0.9980	0.9993	0.99997857	0.99998704	1.00000150	1.00000314	0.99786497	0.99931809
34	0.9981	0.9995	0.99997857	0.99998644	1.00000210	1.00000346	0.99795901	0.99946677
35	0.9979	0.9993	0.99997887	0.99998603	1.00000290	1.00000384	0.99780872	0.99934600
36	0.9976	0.9992	0.99997967	0.99998635	1.00000360	1.00000426	0.99749251	0.99925268
37	0.9976	0.9992	0.99998117	0.99998800	1.00000440	1.00000460	0.99749267	0.99918382
38	0.9978	0.9992	0.99998347	0.99999088	1.00000510	1.00000494	0.99775484	0.99919454
39	0.9978	0.9990	0.99998638	0.99999455	1.00000570	1.00000522	0.99770902	0.99897950
40	0.9976	0.9988	0.99998968	0.99999844	1.00000650	1.00000548	0.99754613	0.99882042
41	0.9973	0.9986	0.99999369	1.00000240	1.00000751	1.00000610	0.99723292	0.99868176
42	0.9970	0.9984	0.99999870	1.00000645	1.00000941	1.00000734	0.99699462	0.99844155
43	0.9963	0.9984	1.00000471	1.00001036	1.00001181	1.00000915	0.99635206	0.99841180
44	0.9964	0.9982	1.00001152	1.00001442	1.00001472	1.00001129	0.99647552	0.99827144
45	0.9967	0.9979	1.00001854	1.00001871	1.00001753	1.00001341	0.99675516	0.99793763
46	0.9964	0.9978	1.00002486	1.00002246	1.00001983	1.00001518	0.99653937	0.99788814
47	0.9959	0.9976	1.00002968	1.00002484	1.00002154	1.00001628	0.99603063	0.99766837
48	0.9953	0.9968	1.00003289	1.00002595	1.00002215	1.00001673	0.99549010	0.99692891
49	0.9946	0.9968	1.00003509	1.00002627	1.00002235	1.00001683	0.99476921	0.99687281
50	0.9943	0.9970	1.00003740	1.00002655	1.00002265	1.00001691	0.99447125	0.99706672
51	0.9944	0.9968	1.00004052	1.00002772	1.00002265	1.00001695	0.99462206	0.99687846
52	0.9940	0.9966	1.00004525	1.00003051	1.00002216	1.00001685	0.99419591	0.99675251
53	0.9936	0.9961	1.00005130	1.00003495	1.00002106	1.00001666	0.99383634	0.99622721
54	0.9932	0.9958	1.00005866	1.00004071	1.00001976	1.00001638	0.99351002	0.99588637
55	0.9919	0.9955	1.00006685	1.00004694	1.00001836	1.00001604	0.99225561	0.99556878
56	0.9914	0.9945	1.00007394	1.00005226	1.00001736	1.00001587	0.99175153	0.99461636
57	0.9903	0.9934	1.00007840	1.00005549	1.00001726	1.00001601	0.99068863	0.99346256
58	0.9893	0.9934	1.00008043	1.00005671	1.00001797	1.00001652	0.98974307	0.99347411
59	0.9892	0.9939	1.00008054	1.00005663	1.00001918	1.00001722	0.98961512	0.99398481

Table J-4. 1990 and 1995 Survival Rates for Hawaii (continued)

Age	Hawaii 1990 ¹		Survival Improving Factor ²				Hawaii 1995	
	Male Survival Rates (Lx+1)/Lx	Female Survival Rates (Lx+1)/Lx	Male 1990-2000	Male 2000-2050	Female 1990-2000	Female 2000-2050	Male Survival Rate	Female Survival Rate
60	0.9865	0.9939	1.00008055	1.00005674	1.00002069	1.00001801	0.98692737	0.99399479
61	0.9860	0.9932	1.00008512	1.00005996	1.00002180	1.00001884	0.98640168	0.99329798
62	0.9872	0.9922	1.00009800	1.00006887	1.00002272	1.00001963	0.98769965	0.99231610
63	0.9864	0.9914	1.00011965	1.00008358	1.00002324	1.00002039	0.98701468	0.99150449
64	0.9841	0.9910	1.00014626	1.00010150	1.00002396	1.00002153	0.98483052	0.99111706
65	0.9824	0.9901	1.00017349	1.00011950	1.00002559	1.00002326	0.98323237	0.99023649
66	0.9813	0.9884	1.00019837	1.00013639	1.00002712	1.00002493	0.98232233	0.98849304
67	0.9795	0.9878	1.00021933	1.00015147	1.00002795	1.00002581	0.98056923	0.98794490
68	0.9772	0.9866	1.00013344	1.00018442	1.00002828	1.00002613	0.97782769	0.98677234
69	0.9748	0.9869	1.00024834	1.00017527	1.00002819	1.00002585	0.97604930	0.98699291
70	0.9734	0.9864	1.00026144	1.00018604	1.00002801	1.00002573	0.97466621	0.98649197
71	0.9693	0.9839	1.00027200	1.00019539	1.00003158	1.00002862	0.97062313	0.98402718
72	0.9651	0.9820	1.00027730	1.00020200	1.00004207	1.00003736	0.96647666	0.98216515
73	0.9651	0.9789	1.00027720	1.00020598	1.00005951	1.00005198	0.96642315	0.97916059
74	0.9657	0.9758	1.00027484	1.00020965	1.00008204	1.00007081	0.96701295	0.97619237
75	0.9623	0.9734	1.00027271	1.00021432	1.00010631	1.00009099	0.96364990	0.97390814
76	0.9563	0.9715	1.00026886	1.00021654	1.00012844	1.00010919	0.95762649	0.97208216
77	0.9514	0.9698	1.00026057	1.00021245	1.00014533	1.00012256	0.95259481	0.97048643
78	0.9428	0.9658	1.00024842	1.00020226	1.00015592	1.00013071	0.94402137	0.96653184
79	0.9401	0.9613	1.00023131	1.00018689	1.00016284	1.00013581	0.94116312	0.96204062
80	0.9390	0.9589	1.00021107	1.00016958	1.00017013	1.00014132	0.94001067	0.95971030
81	0.9274	0.9537	1.00019885	1.00015982	1.00018132	1.00015050	0.92828516	0.95455400
82	0.9222	0.9438	1.00020805	1.00016775	1.00019949	1.00016604	0.92314251	0.94472099
83	0.9215	0.9362	1.00024348	1.00019668	1.00022566	1.00018885	0.92259877	0.93723539
84	0.9127	0.9316	1.00030208	1.00024259	1.00025845	1.00021677	0.91405334	0.93277669
85	0.8486	0.8780	1.00050356	1.00038069	1.00046257	1.00035994	0.85074278	0.88001150

¹ From Hawaii Life Table.

² For Asian and Pacific Islanders. Bureau of the Census.

Table J-5. Fertility Rates for Other Civilian Females, 1990 and 1995

Age of mother	1990 other civilian population females ¹	Male births (ave. 1989-91)	Female births (ave. 1989-91)	Birth rates for 1990, (1/1,000)		1995 other civilian population females	Birth rates for 1995 ² , (1/1,000)	
				Males	Females		Males	Females
12	6,540	0	0	0.1	0.0	7,467	0.1	0.0
13	6,311	1	2	0.2	0.3	7,353	0.2	0.3
14	6,263	11	11	1.8	1.8	7,378	1.8	1.9
15	6,240	48	39	7.7	6.3	7,198	8.1	6.6
16	6,173	103	97	16.7	15.7	6,897	17.5	16.4
17	6,624	169	168	25.5	25.4	7,156	26.7	26.6
18	6,300	261	239	41.5	37.9	7,487	43.5	39.8
19	6,747	326	343	48.4	50.8	7,389	50.7	53.2
20	6,711	379	331	56.5	49.4	7,060	59.2	51.8
21	6,336	383	347	60.5	54.7	6,275	63.4	57.4
22	6,417	359	371	55.9	57.9	6,188	58.6	60.7
23	6,671	411	372	61.6	55.8	5,426	64.6	58.5
24	7,371	415	398	56.3	54.0	5,598	59.1	56.6
25	7,300	427	424	58.4	58.0	5,400	61.3	60.8
26	7,734	492	422	63.7	54.6	5,873	66.7	57.2
27	7,887	479	446	60.7	56.5	6,181	63.6	59.2
28	7,554	474	434	62.8	57.5	6,255	65.8	60.2
29	8,438	459	436	54.4	51.7	7,156	57.1	54.2
30	8,466	464	441	54.8	52.1	7,769	57.4	54.6
31	8,434	424	404	50.2	47.9	7,961	52.7	50.2
32	8,297	395	366	47.6	44.2	8,021	49.9	46.3
33	8,533	364	319	42.6	37.4	8,282	44.7	39.2
34	9,314	317	298	34.0	32.0	9,003	35.6	33.5
35	8,865	272	260	30.6	29.3	8,970	32.1	30.7
36	8,430	225	210	26.7	24.9	8,827	27.9	26.1
37	8,629	190	174	22.0	20.2	9,167	23.0	21.1
38	8,082	138	134	17.0	16.6	9,030	17.9	17.4
39	8,519	91	93	10.7	10.9	9,777	11.2	11.4
40	8,252	70	71	8.4	8.6	9,598	8.8	9.0
41	7,952	47	41	5.9	5.2	9,402	6.2	5.4
42	7,742	30	22	3.8	2.9	9,020	4.0	3.0
43	7,632	11	14	1.5	1.8	8,743	1.6	1.9
44	6,450	6	6	0.9	0.9	8,874	1.0	1.0
45	6,677	3	3	0.5	0.4	8,778	0.5	0.4
46	6,278	1	2	0.2	0.3	8,177	0.2	0.3
47	6,024	0	0	0.1	0.0	7,990	0.1	0.0

¹ Excluding military dependents.

² 1990 birth rate*birth rate improving factor (1.048).

Table J-7. Other Civilians: Population, Births, Deaths, and Net Migration, 1960–1995

Year	Population (July 1) ¹	Calendar Year		Fiscal Year		Net Migration		3-yr centered moving ave.
		Births ²	Deaths ³	Births	Deaths	Total ⁴	% of total other civilian	
1960	522,076	12,217	3,449	--	--	--	--	--
1961	535,839	12,607	3,277	12,412	3,363	4,714	0.9	--
1962	541,305	12,865	3,395	12,736	3,336	(3,934)	-0.7	3,773
1963	561,184	12,734	3,523	12,800	3,459	10,538	1.9	(2,041)
1964	557,594	12,623	3,558	12,679	3,541	(12,728)	-2.3	5,296
1965	584,607	12,382	3,579	12,503	3,568	18,079	3.1	2,043
1966	593,645	11,405	3,691	11,893	3,635	779	0.1	7,664
1967	605,246	11,050	3,828	11,227	3,759	4,133	0.7	3,695
1968	618,310	10,684	4,123	10,867	3,976	6,173	1.0	8,983
1969	642,057	11,725	4,074	11,204	4,099	16,642	2.6	10,856
1970	660,000	12,530	3,801	12,127	3,938	9,753	1.5	15,532
1971	688,600	12,124	4,051	12,327	3,926	20,200	2.9	14,525
1972	710,100	11,781	4,097	11,952	4,074	13,622	1.9	13,127
1973	723,200	11,590	4,189	11,685	4,143	5,558	0.8	10,244
1974	742,200	11,676	4,183	11,633	4,186	11,553	1.6	10,338
1975	763,700	11,865	4,161	11,771	4,172	13,902	1.8	11,066
1976	779,400	12,473	4,265	12,169	4,213	7,744	1.0	10,166
1977	796,800	13,126	4,239	12,799	4,252	8,853	1.1	7,748
1978	812,200	13,020	4,400	13,073	4,319	6,647	0.8	8,454
1979	830,900	13,744	4,691	13,382	4,545	9,864	1.2	7,615
1980	846,500	14,361	4,885	14,052	4,788	6,336	0.7	5,777
1981	857,300	14,693	4,833	14,527	4,859	1,132	0.1	4,201
1982	872,200	14,697	5,028	14,695	4,930	5,136	0.6	5,189
1983	891,200	15,031	5,296	14,864	5,162	9,298	1.0	5,747
1984	903,500	14,730	5,480	14,881	5,388	2,808	0.3	6,230
1985	919,000	14,259	5,679	14,495	5,580	6,585	0.7	3,096
1986	927,500	14,325	5,693	14,292	5,686	(106)	0.0	5,127
1987	945,000	14,629	6,067	14,477	5,880	8,903	0.9	2,665
1988	953,100	15,143	5,902	14,886	5,985	(802)	-0.1	7,907
1989	977,900	15,545	6,425	15,344	6,164	15,620	1.6	8,097
1990	997,030	16,375	6,754	15,960	6,590	9,474	1.0	10,109
1991	1,015,493	16,259	6,672	16,317	6,713	5,234	0.5	9,821
1992	1,040,886	15,988	6,828	16,124	6,750	14,755	1.4	6,797
1993	1,050,868	16,031	7,169	16,010	6,999	403	0.0	8,904
1994	1,071,096	15,740	7,182	15,886	7,176	11,553	1.1	3,110
1995	1,078,523	14,842	7,476	15,291	7,329	(2,628)	-0.2	4,463

¹ Other civilian population is the resident population net of military personnel and their dependents.

² Includes other civilian births in Hawaii and out-of-state. Estimated by DBEDT based on data from Department of Health.

³ Includes other civilian deaths in Hawaii and out-of-state. Estimated by DBEDT based on data from Department of Health.

⁴ Calculated: Non-military POP(t) - POP(t-1) + Deaths - Births.

APPENDIX K
DATA BASE FOR COUNTY ALLOCATION
SUBMODEL

Table K-1. Honolulu County: Population, Income, and Jobs

Year	Population (1,000)	Total Personal Income (\$mil.)	Per Capita Personal Income (\$)	Total Jobs (1,000)	Wage & Salary Jobs (1,000)	Construction Jobs (1,000)	Manufacturing Jobs (1,000)	Trans., & Comm., & Util. Jobs (1,000)	Trade Jobs (1,000)
1970	631.6	8314.9	13164.9	274.0	253.0	22.6	18.6	20.4	43.7
1971	654.6	8604.2	13144.2	279.8	258.4	20.0	18.4	20.5	44.5
1972	674.9	9148.3	13555.1	286.0	267.9	20.2	18.5	21.1	46.4
1973	691.4	9627.3	13924.4	298.9	280.4	22.9	17.7	21.4	49.3
1974	707.6	9637.1	13619.5	306.4	287.5	23.8	17.1	22.2	49.3
1975	718.6	9749.8	13567.8	308.6	290.2	22.5	17.2	22.1	49.6
1976	728.3	10120.1	13895.6	312.1	294.0	17.8	17.1	22.6	51.6
1977	737.0	10314.6	13995.4	319.8	301.2	16.4	17.2	23.3	53.2
1978	742.6	10630.9	14315.8	334.4	315.5	17.1	17.5	23.7	55.4
1979	756.0	11066.9	14638.8	348.2	328.5	19.0	17.7	25.4	57.8
1980	764.6	11398.3	14907.6	357.9	335.8	19.0	17.1	26.0	59.0
1981	767.6	11451.7	14918.8	357.4	335.1	17.6	16.8	26.6	58.5
1982	776.1	11462.6	14769.4	352.2	328.4	14.4	16.4	26.0	58.0
1983	789.1	12049.2	15269.6	357.1	332.8	14.7	16.5	25.8	57.8
1984	797.8	12441.8	15595.2	362.2	336.9	13.1	15.8	26.4	59.6
1985	804.3	12880.9	16015.1	369.8	345.0	14.1	15.9	27.1	60.2
1986	810.4	13518.8	16681.6	379.8	354.1	15.2	16.3	28.0	60.4
1987	818.4	14015.6	17125.6	391.8	369.3	16.8	16.2	30.2	63.0
1988	824.1	14604.9	17722.3	404.6	380.8	18.5	16.5	31.2	64.9
1989	831.3	15111.9	18178.7	421.7	397.9	22.4	16.2	32.5	67.7
1990	838.0	16089.5	19200.0	436.0	413.0	24.6	15.9	34.3	68.0
1991	845.5	15955.8	18872.0	441.9	417.9	25.4	15.2	35.3	67.6
1992	856.4	16535.1	19308.1	443.9	420.3	24.2	14.3	35.6	66.8
1993	861.9	16453.4	19090.8	442.7	416.9	24.2	14.0	34.1	65.8
1994	869.5	16443.2	18911.1	436.3	413.6	22.4	13.4	34.0	65.6
1995	870.9	16622.0	19086.0	431.8	410.4	20.4	12.9	33.2	66.6

Table K-1. Honolulu County: Population, Income, and Jobs (continued)

Year	Eating & Drinking Places Jobs (1,000)	Finance, Insurance, & Real Estate Jobs (1,000)	Hotel Jobs (1,000)	Other Services Jobs (1,000)	Federal Government Jobs (1,000)	State & Local Government Jobs (1,000)	Agriculture Jobs (1,000)	Self-Employed Jobs (1,000)
1970	15.7	16.5	9.3	38.8	32.5	31.8	3.0	21.0
1971	16.2	17.2	10.6	39.8	32.1	36.3	2.9	21.3
1972	17.6	18.3	11.9	41.9	31.8	37.5	2.8	17.9
1973	19.5	20.5	12.6	46.0	30.7	37.3	2.6	18.0
1974	20.6	21.8	12.9	48.7	30.1	38.7	2.6	18.1
1975	21.0	21.5	13.2	49.7	29.7	41.2	2.8	18.3
1976	22.6	21.9	13.4	51.8	29.0	43.8	2.8	17.9
1977	24.0	22.5	14.1	54.9	28.4	44.6	2.7	18.3
1978	26.5	25.2	14.4	59.0	28.4	45.5	2.9	18.8
1979	27.8	27.4	15.1	62.2	28.5	45.0	2.8	19.1
1980	28.6	28.5	15.2	64.1	28.9	46.7	2.7	21.9
1981	28.8	27.3	14.5	67.0	29.3	46.2	2.8	22.3
1982	28.1	27.2	14.7	64.5	30.4	46.2	2.7	23.7
1983	28.5	27.3	14.9	67.4	31.0	46.4	2.7	24.2
1984	30.0	27.2	15.8	68.8	30.9	46.9	2.5	25.0
1985	31.7	27.0	16.1	71.2	31.2	47.9	2.7	24.8
1986	32.2	28.0	16.3	76.0	30.9	48.3	2.6	25.6
1987	33.9	28.4	16.9	80.4	31.4	49.4	2.8	22.5
1988	34.6	28.8	17.6	82.7	32.4	51.2	2.7	23.7
1989	34.2	28.7	18.7	90.3	32.5	52.5	2.4	23.8
1990	34.7	29.8	19.7	95.8	32.6	55.5	2.3	22.5
1991	34.7	30.5	20.0	97.1	32.3	57.6	2.3	24.0
1992	35.4	31.3	19.6	100.2	31.7	59.3	2.2	23.6
1993	34.7	32.2	18.3	101.3	30.1	60.3	2.1	25.8
1994	34.3	31.8	18.4	101.5	29.5	60.7	2.1	22.7
1995	34.8	30.5	18.2	102.3	29.0	60.6	2.0	21.4

Table K-2. Maui County: Population, Income, and Jobs

Year	Population (1,000)	Total Personal Income (\$mil.)	Per Capita Personal Income (\$)	Total Jobs (1,000)	Wage & Salary Jobs (1,000)	Construction Jobs (1,000)	Manufacturing Jobs (1,000)	Trans., & Comm., & Util. Jobs (1,000)	Trade Jobs (1,000)
1970	46.5	506.7	10896.4	21.1	18.1	1.1	2.3	1.2	2.2
1971	49.1	539.2	10982.6	21.5	18.7	1.2	2.2	1.1	2.3
1972	51.5	572.2	11111.1	21.6	19.2	1.3	2.2	1.2	2.5
1973	53.4	598.6	11209.0	22.3	20.0	1.4	2.1	1.3	2.8
1974	53.8	745.9	13865.1	23.7	20.8	1.7	2.0	1.3	2.9
1975	56.8	709.4	12489.8	25.4	22.9	1.6	2.2	1.4	3.1
1976	60.3	751.1	12455.9	26.6	24.1	1.5	2.1	1.4	3.3
1977	63.0	795.2	12621.5	28.3	25.5	1.5	2.1	1.5	3.6
1978	66.2	825.4	12468.6	31.0	27.9	1.6	2.2	1.5	4.0
1979	69.7	887.8	12736.8	32.7	29.6	2.0	2.1	1.6	4.3
1980	71.6	974.6	13611.1	33.9	30.8	1.9	2.1	1.7	4.5
1981	74.0	926.6	12521.7	35.2	32.0	1.7	2.0	1.8	4.5
1982	77.1	964.9	12514.9	36.6	33.3	1.4	2.0	1.8	4.8
1983	80.1	1080.8	13492.7	37.9	34.4	1.1	2.0	1.9	5.1
1984	83.0	1098.9	13240.1	39.0	35.4	1.0	2.0	2.0	5.4
1985	85.1	1159.3	13622.7	41.1	37.6	1.3	2.1	2.3	6.1
1986	87.4	1269.2	14521.5	42.5	39.0	1.5	2.0	2.2	6.4
1987	90.5	1318.9	14573.1	45.1	41.6	1.8	2.1	2.4	6.7
1988	93.8	1420.8	15147.4	48.1	44.4	2.3	2.1	2.4	7.3
1989	96.8	1521.9	15721.9	51.9	47.9	3.1	2.0	2.8	7.8
1990	101.6	1692.7	16665.3	55.7	50.9	3.1	2.0	3.1	8.4
1991	105.0	1706.8	16258.2	58.3	52.9	3.2	2.2	3.2	8.8
1992	107.5	1816.2	16894.2	60.6	54.9	2.8	2.3	3.3	9.0
1993	110.4	1875.6	16995.3	62.4	56.2	2.6	2.2	3.2	9.1
1994	112.7	1917.8	17019.4	62.2	56.3	2.5	1.8	3.4	9.1
1995	115.2	1955.5	16981.9	61.6	55.8	2.0	1.8	3.4	9.2

Table K-2. Maui County: Population, Income, and Jobs (continued)

Year	Eating & Drinking Places Jobs (1,000)	Finance, Insurance, & Real Estate Jobs (1,000)	Hotel Jobs (1,000)	Other Services Jobs (1,000)	Federal Government Jobs (1,000)	State & Local Government Jobs (1,000)	Agriculture Jobs (1,000)	Self-Employed Jobs (1,000)
1970	0.8	0.5	1.4	1.8	0.2	2.7	4.1	2.8
1971	0.9	0.5	1.6	1.8	0.2	2.8	4.0	2.8
1972	1.0	0.7	2.0	1.8	0.2	2.9	3.6	2.4
1973	1.0	0.9	2.2	1.9	0.2	2.9	3.4	2.3
1974	1.3	1.0	2.3	2.1	0.2	2.9	3.2	2.4
1975	1.6	1.3	2.5	2.5	0.2	3.3	3.4	2.6
1976	1.7	1.2	3.0	2.7	0.2	3.7	3.3	2.6
1977	2.1	1.6	3.3	3.0	0.3	3.8	3.1	2.7
1978	2.2	1.8	3.7	3.4	0.3	4.0	3.4	3.0
1979	2.4	2.1	4.3	3.5	0.3	3.8	3.2	3.1
1980	2.5	2.2	4.8	3.7	0.3	3.9	3.3	3.1
1981	2.7	2.3	5.3	4.0	0.3	4.1	3.5	3.2
1982	2.8	2.2	6.4	4.2	0.3	4.1	3.4	3.3
1983	3.5	2.5	6.4	4.3	0.3	4.1	3.4	3.5
1984	3.8	2.5	6.5	4.6	0.4	4.2	3.3	3.5
1985	4.0	2.6	6.6	5.3	0.4	4.3	3.0	3.6
1986	4.5	2.6	6.4	5.9	0.3	4.5	2.9	3.6
1987	4.7	2.5	7.3	6.5	0.4	4.6	2.8	3.5
1988	4.8	2.7	8.0	7.2	0.4	4.9	2.6	3.7
1989	5.3	3.1	8.1	7.9	0.4	5.1	2.6	4.0
1990	5.3	3.3	9.1	8.3	0.4	5.4	2.6	4.8
1991	5.3	3.2	9.7	8.6	0.5	5.9	2.6	5.4
1992	5.5	2.9	11.1	9.2	0.5	6.4	2.2	5.7
1993	5.5	3.0	11.7	9.8	0.5	6.7	2.2	6.2
1994	5.7	2.9	11.4	10.3	0.5	6.9	2.0	5.9
1995	5.8	3.0	11.0	10.5	0.5	7.0	1.9	5.8

Table K-3. Hawaii County: Population, Income, and Jobs

Year	Population (1,000)	Total Personal Income (\$mil.)	Per Capita Personal Income (\$)	Total Jobs (1,000)	Wage & Salary Jobs (1,000)	Construction Jobs (1,000)	Manufacturing Jobs (1,000)	Trans., & Comm., & Util. Jobs (1,000)	Trade Jobs (1,000)
1970	63.8	683.6	10713.9	29.5	23.8	1.7	3.0	1.4	4.0
1971	67.0	736.3	10990.1	30.1	24.5	1.8	2.9	1.4	4.4
1972	70.0	781.7	11167.7	29.4	25.0	1.8	2.9	1.5	4.3
1973	73.9	816.5	11048.2	30.2	25.7	1.9	2.7	1.6	4.4
1974	74.0	1038.9	14039.6	31.1	25.9	1.8	2.6	1.7	4.4
1975	77.4	935.8	12091.0	32.4	27.8	1.6	3.0	1.8	4.3
1976	80.7	935.8	11596.6	33.0	28.4	1.5	2.9	1.9	4.5
1977	82.8	968.7	11699.1	33.8	28.9	1.4	2.8	1.9	4.6
1978	85.9	1004.8	11697.5	35.4	30.0	1.5	2.8	2.0	4.7
1979	89.4	1062.6	11885.8	36.3	30.8	1.7	2.9	2.0	5.0
1980	92.9	1224.6	13182.2	38.2	31.8	2.0	2.9	1.9	5.1
1981	96.1	1117.7	11630.5	39.1	32.6	1.9	2.9	2.0	5.3
1982	98.8	1129.1	11428.1	39.1	32.5	1.5	2.8	1.9	5.3
1983	100.8	1212.3	12027.0	39.9	33.2	1.3	2.7	1.8	5.5
1984	103.5	1208.3	11674.1	41.0	34.2	1.2	2.8	1.9	5.9
1985	105.9	1239.0	11699.5	42.4	35.7	1.3	2.8	2.1	6.3
1986	108.4	1346.6	12422.9	43.3	36.6	1.4	2.7	2.1	6.6
1987	111.7	1390.2	12446.2	45.6	39.0	2.0	2.5	2.1	7.1
1988	113.4	1447.9	12767.9	47.5	40.7	2.0	2.4	2.2	7.3
1989	116.6	1540.2	13209.5	52.0	45.0	2.5	2.4	2.4	7.9
1990	121.5	1699.1	13989.1	55.9	49.0	3.3	2.3	2.5	8.7
1991	126.0	1728.6	13714.0	59.4	51.7	3.7	2.3	2.6	9.1
1992	129.9	1765.2	13587.6	59.0	51.3	3.0	2.3	2.6	9.0
1993	132.9	1786.3	13442.0	58.8	50.8	3.0	2.3	2.6	8.8
1994	134.8	1790.6	13278.8	57.6	50.3	2.6	2.1	2.7	8.8
1995	137.2	1806.7	13171.6	56.3	49.4	2.6	1.8	2.6	9.0

Table K-3. Hawaii County: Population, Income, and Jobs (continued)

Year	Eating & Drinking Places Jobs (1,000)	Finance, Insurance, & Real Estate Jobs (1,000)	Hotel Jobs (1,000)	Other Services Jobs (1,000)	Federal Government Jobs (1,000)	State & Local Government Jobs (1,000)	Agriculture Jobs (1,000)	Self-Employed Jobs (1,000)
1970	1.1	0.9	1.8	2.0	0.4	4.0	3.6	5.5
1971	1.2	0.9	2.0	2.1	0.4	4.3	3.1	5.5
1972	1.2	0.9	2.5	2.1	0.4	4.4	3.2	4.5
1973	1.3	0.9	2.9	2.2	0.4	4.3	3.2	4.5
1974	1.3	0.9	3.1	2.5	0.4	4.4	3.1	4.6
1975	1.5	1.0	3.1	2.8	0.4	5.0	3.4	4.6
1976	1.4	1.1	3.1	3.0	0.5	5.4	3.5	4.7
1977	1.6	1.0	3.2	3.2	0.5	5.7	3.3	4.8
1978	1.8	1.0	3.2	3.5	0.5	5.8	3.5	5.2
1979	2.0	1.1	3.1	3.7	0.6	5.7	3.2	5.3
1980	1.9	1.2	3.1	3.9	0.6	5.9	3.3	6.4
1981	2.0	1.3	3.0	4.1	0.6	5.9	3.8	6.5
1982	2.1	1.4	3.3	4.1	0.6	6.0	3.8	6.6
1983	2.3	1.4	3.6	4.3	0.6	6.1	3.8	6.7
1984	2.4	1.4	3.8	4.4	0.7	6.1	3.8	6.8
1985	2.7	1.5	4.0	4.9	0.7	6.3	3.5	6.7
1986	2.7	1.7	4.0	5.2	0.7	6.5	3.4	6.8
1987	2.8	1.8	4.1	5.7	0.7	6.7	3.7	6.6
1988	2.9	1.8	4.7	6.1	0.8	7.0	3.6	6.9
1989	3.4	2.0	6.0	6.9	0.8	7.2	3.6	7.1
1990	3.8	2.4	6.3	8.0	0.8	7.6	3.5	6.9
1991	3.9	2.4	6.6	8.4	0.8	8.3	3.7	7.8
1992	3.7	2.5	6.2	8.6	0.8	8.8	3.8	7.7
1993	3.5	2.6	6.0	9.0	0.9	9.1	3.2	8.0
1994	3.6	2.5	5.6	9.4	0.9	9.3	3.0	7.3
1995	3.6	2.3	5.6	9.5	0.9	9.2	2.5	7.0

Table K-4. Kauai County: Population, Income, and Jobs

Year	Population (1,000)	Total Personal Income (\$mil.)	Per Capita Personal Income (\$)	Total Jobs (1,000)	Wage & Salary Jobs (1,000)	Construction Jobs (1,000)	Manufacturing Jobs (1,000)	Trans., & Comm., & Util. Jobs (1,000)	Trade Jobs (1,000)
1970	29.8	315.9	10599.2	13.0	11.2	0.4	1.7	1.1	1.4
1971	30.9	335.1	10843.6	13.4	11.8	0.5	1.6	1.0	1.5
1972	31.9	345.2	10820.1	13.0	11.9	0.5	1.4	1.1	1.6
1973	32.9	361.4	10985.7	13.6	12.3	0.6	1.3	1.4	1.5
1974	32.6	460.6	14128.9	13.6	12.0	0.7	1.1	1.2	1.7
1975	33.4	396.2	11861.4	14.6	13.1	0.7	1.3	1.3	1.7
1976	34.9	405.8	11626.4	15.2	13.9	0.7	1.3	1.3	1.9
1977	35.5	420.8	11854.3	15.9	14.5	0.6	1.2	1.6	2.0
1978	36.8	429.7	11675.7	16.7	15.3	0.6	1.3	1.7	2.1
1979	38.1	453.6	11904.5	17.3	15.9	0.7	1.3	1.6	2.2
1980	39.4	515.6	13086.7	18.4	16.7	1.1	1.3	1.6	2.3
1981	40.5	476.8	11771.9	18.3	16.7	0.9	1.3	1.6	2.2
1982	41.8	491.0	11747.5	18.3	16.6	0.7	1.3	1.6	2.3
1983	42.8	530.2	12388.4	18.9	17.1	0.8	1.3	1.7	2.6
1984	43.6	523.6	12009.6	19.0	17.0	0.5	1.3	1.8	2.8
1985	44.4	548.4	12350.8	19.9	18.0	0.6	1.3	1.9	2.8
1986	45.6	590.4	12947.8	21.2	19.2	0.7	1.2	2.0	3.1
1987	47.2	611.2	12949.1	22.5	20.6	0.8	1.1	2.1	3.2
1988	48.5	703.1	14497.3	24.3	22.2	0.8	1.1	2.3	3.3
1989	49.8	754.3	15145.7	26.6	24.4	1.3	1.0	2.4	3.6
1990	51.6	810.2	15694.7	27.3	25.1	1.4	0.9	2.4	4.1
1991	53.2	832.5	15662.9	28.8	26.4	1.4	0.8	2.3	4.1
1992	54.0	519.2	9614.8	27.9	25.7	1.7	0.8	1.8	3.9
1993	54.9	849.1	15476.9	25.9	23.6	2.7	0.8	1.5	3.8
1994	55.6	876.5	15760.7	26.2	24.1	1.8	0.5	1.8	3.9
1995	56.0	871.5	15568.5	26.5	24.5	1.5	0.5	1.5	4.3

Table K-4. Kauai County: Population, Income, and Jobs (continued)

Year	Eating & Drinking Places Jobs (1,000)	Finance, Insurance, & Real Estate Jobs (1,000)	Hotel Jobs (1,000)	Other Services Jobs (1,000)	Federal Government Jobs (1,000)	State & Local Government Jobs (1,000)	Agriculture Jobs (1,000)	Self-Employed Jobs (1,000)
1970	0.4	0.2	1.0	1.2	0.3	1.8	1.7	1.6
1971	0.4	0.3	1.3	1.3	0.3	1.9	1.8	1.6
1972	0.5	0.3	1.4	1.2	0.3	2.0	1.7	1.2
1973	0.7	0.4	1.4	1.4	0.4	1.9	1.6	1.3
1974	0.7	0.4	1.3	1.4	0.4	1.9	1.3	1.3
1975	0.9	0.6	1.3	1.6	0.3	2.1	1.6	1.4
1976	0.9	0.7	1.5	1.6	0.3	2.3	1.6	1.4
1977	1.1	0.8	1.6	1.6	0.3	2.4	1.5	1.4
1978	1.2	0.9	1.6	1.8	0.3	2.5	1.6	1.4
1979	1.3	0.9	1.7	1.9	0.3	2.4	1.6	1.4
1980	1.4	1.0	1.9	1.9	0.3	2.5	1.6	1.7
1981	1.5	0.9	2.0	2.1	0.3	2.6	1.5	1.6
1982	1.5	0.9	2.2	2.0	0.3	2.6	1.4	1.8
1983	1.5	0.9	2.2	2.1	0.3	2.6	1.4	1.8
1984	1.5	0.9	2.2	2.1	0.3	2.5	1.3	1.9
1985	1.8	0.9	2.5	2.3	0.3	2.5	1.3	1.9
1986	2.2	1.0	2.7	2.5	0.3	2.6	1.3	2.1
1987	2.3	1.1	3.1	2.8	0.3	2.7	1.3	1.9
1988	2.3	1.2	4.1	3.0	0.3	2.8	1.2	2.1
1989	2.7	1.5	4.3	3.4	0.4	2.9	1.2	2.3
1990	2.9	1.4	3.8	3.7	0.4	3.0	1.2	2.2
1991	3.0	1.4	4.6	4.3	0.4	3.2	1.2	2.4
1992	2.5	1.3	4.1	4.7	0.4	3.5	1.1	2.3
1993	1.8	1.2	2.1	4.5	0.4	3.8	1.1	2.3
1994	2.2	1.3	2.7	4.7	0.4	3.7	1.1	2.1
1995	2.4	1.4	3.2	4.8	0.4	3.7	1.0	2.1